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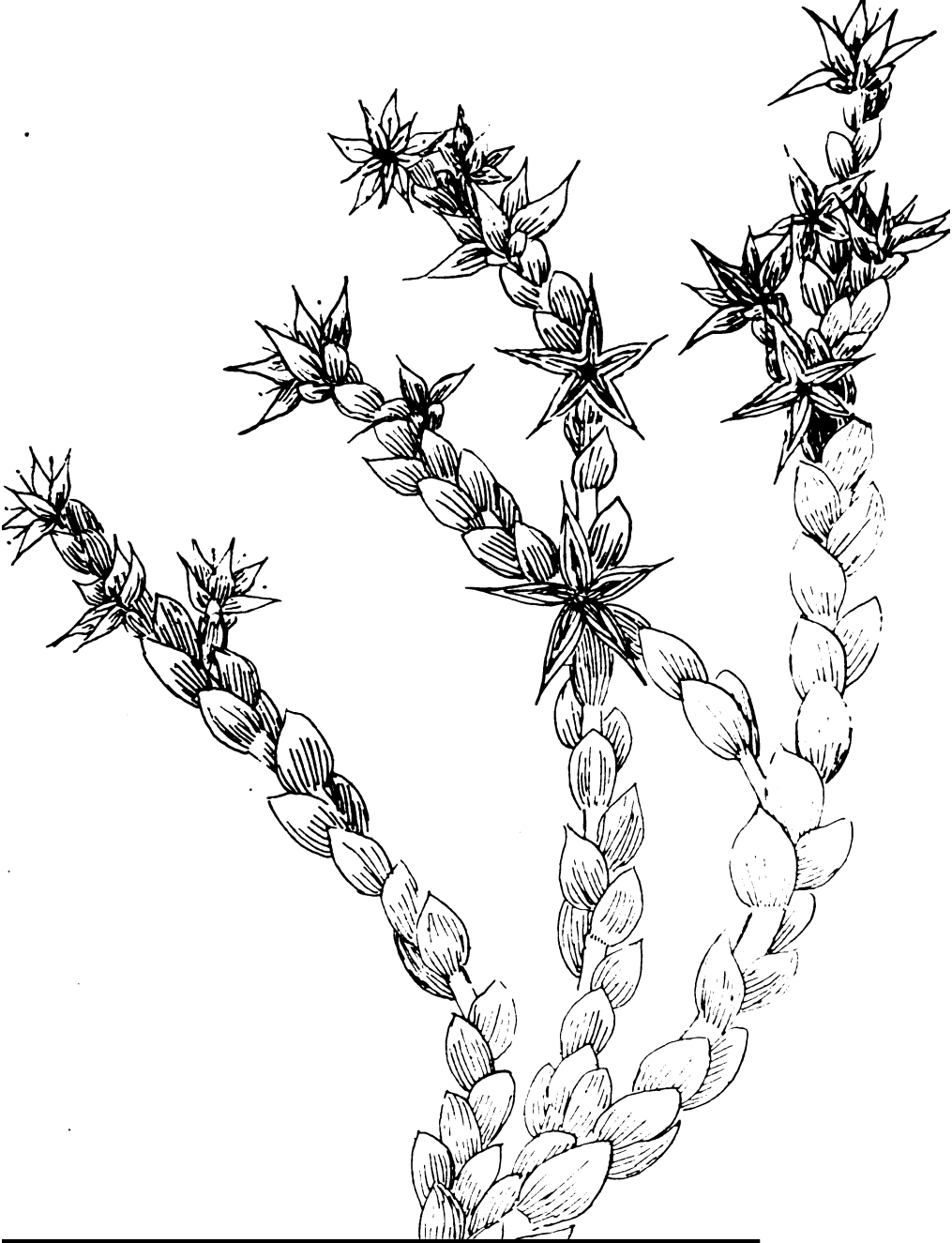

Montana botany notes

Marcus Eugene Jones

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BULLETIN, UNIVERSITY OF MONTANA
BIOLOGICAL SERIES No. 15

Number 61

MONTANA BOTANY NOTES

CONTAINING

Description of New Species, List of Plants Not Heretofore Recorded From the State, and Notes on Disputed Species, With Five Plates

BY

MARCUS E. JONES, A. M.

Prepared From Material Collected at the University of Montana Biological Station

UNIVERSITY OF MONTANA
Missoula, Montana, U. S. A.
March, 1910

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PLATE I.

Cliffs, glacier and waterfalls, looking west at Gunsight Pass, on the Hudson Bay side, continental divide, showing characteristic country in which collections of alpine plants were made.

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PREFACE

The object of this paper is simply to publish at this time the main results of the work done by Marcus E. Jones in connection with the Biological Station at Bigfork, so far as important notes, changes of names due to exhaustive field work and new species are concerned. The ecological work and detailed statement of species and localities, zonal distribution, etc., are reserved for a subsequent paper. In addition such additions to the Flathead drainage flora as have been made by Prof. Elrod, Miss Norton and others are here given for the first time, and credited to them. The total flora passed in review covers some 1700 species. The flora of the Flathead Lake region has now been thoroughly worked up except the early spring flora which is meager. It has been the Mecca of botanists for over a decade, but the only publications on its flora have been a paper on the trees, and one on the lichens and mosses and fungi, all of them very incomplete, and sporadic articles on the ferns and horsetails. The collections of Williams, Mrs. Kennedy, MacDougal, Canby, and others from this region have been reported in Rydberg's list of the flora of Montana. This present list does not include any commentary on the identifications of Rydberg except on a few important species of rare occurrence.

Detailed studies of the trees were made and the results are given in this paper.

The fungi on living leaves were carefully studied and collected.

A careful collection of the mosses was also made and nearly a hundred and thirty-five species were added to the known flora.

In 1908 the main work was around Flathead Lake and the adjacent mountains. In 1909 the main work was in the Bitter Root, on McDonald Peak, at Ravalli, the Flathead Plains, Swan River, and the magnificent Sperry Glacier region where the alpine flora reaches its greatest development. Work was also done at Monida and Lima in both years and along the Oregon Short Line, Northern Pacific and Great Northern railways at way stations.

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NEW SPECIES DESCRIBED

Glyceria flavescens.

Carex Stantonensis, Stanton Lake Carex.

Sedum Elrodi, Elrod's Stonecrop.

Hypericum Nortonae, Miss Norton's St. John's Wort.

Cogswellia Altensis, Alta Cogswellia.

Cymopterus Elrodi, Elrod's Cymopterus.

Sambucus decipiens, The deceptive Elderberry.

Cylindrosporium simile Peck, Fungus on Ceanothus sanguinea.

Cylindrosporium simile var. pruinum Peck, n. var. Fungus on foliage of Prunus emarginata.

Roestelia tubulata Kern, n. sp. Fungus on Crataegus Douglasii.

Septoria streptopidis Peck. On living leaves of Streptopus roseus, Prosartes trachycarpa.

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MONTANA BOTANY NOTES

MARCUS E. JONES

After some four or five seasons spent in various parts of Montana, the last two being in the vicinity of Flathead Lake and the Sperry Glacier region, in connection with the Biological Station work of the State University, it seems advisable to publish at this time the new species and varieties discovered, and such changes of names as the critical field work has proved are needed. To this list is added such plants as are found for the first time within the Flathead drainage.

Polypodium vulgare L. P. hesperium Maxon. This is found sparingly from McDonald lake in the Mission mountains, to MacDougal peak, both in the alpine and Middle Temperate life-zones, and also in the Sperry glacier region. The high altitude forms are diminutive, but the plants growing around Bigfork are the normal ones and show all sorts of intergrades.

Phegopteris alpestris (Hoppe) Mett. This abounds in the alpine basins of the Bitter Root mountains at Como peak and in the Sperry Glacier region. It has doubtless been overlooked from its resemblance to Asplenium Filix foemina, and from its similar habit.

Phegopteris polypodioides Fee. This grows at Gunsight pass in the alpine basin of the lake, just south of Sperry Glacier.

Cheilanthes Feei, Moore. A form of this, with slightly larger final divisions grows sparingly at Mission Creek, and the Sperry Glacier; also found on Silloway peak by MacDougal, and at Sperry Glacier by Williams. This is wrongly referred by Rydberg to C. gracillima.

Cryptogramme Stelleri (Gmel.) Prantl. This has been found at Camass Lake by Williams, at Lake McDonald by Umbach, and by myself at Mission Creek. It grows in crevices of wet rocks, subalpine.

Pellaea densa Brack is locally abundant at McDonald lake and on Mission Creek in the Mission mountains, Middle Temperate life zone.

Asplenium viride Hudson. This is frequent on Mission Creek and at Gunsight Pass, growing in crevices of rocks, subalpine. This is what Rydberg wrongly refers to as A. Trichomanes. There are occasional stipes that are nearly black.

Polystichum Lonchitis var. scopulinum (Eaton Ferns. N. A. 2. 125 as aculeatum var.). The most marked forms of this seem surely to belong to P. aculeatum, but so far as I can find it is never found with that species, but always either with P. Lonchitis or where that naturally grows, it passes directly into that species both in Utah and Lambert Valley in the Mission mountains, where it is alpine.

Cystopteris. Underwood in the sixth edition of his fern book takes up Filix to supersede Cystopteris because Adanson in 1763 published Filix, but the genus was improperly published, as no species were named. In addition Ludwig published a genus called Filix in 1757, but also did it improperly, as there were no species named. The name Filix was taken up by Gilib in 1792 and F. bipinnata was published which is Athyrium or Asplenium Filix-foemina. Therefore the genus Filix has no standing and cannot supersede Cystopteris.

Polystichum munitum (Kaulf.) Presl. MacDougal seems to have gotten this at the foot of MacDougal peak, though it is far out of range.

Botrychium ternatun var. **Coulteri** (Underwood Torr. Bull. 25 537 (1898) as species). Darby and Swan Lake. Tweedy was right in placing this as a variety of B. ternatum, as it intergrades freely.

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Botrychium ternatum var. silaefolium (Presl. Rel. Haenke 1 76 (1830) as species). Bigfork and Swan Lake. This also grades directly into the type.

Equisetum palustre L. Common at Bigfork, the Mission and Hot Springs; also on MacDougal peak.

Equisetum Telmateia Ehrh. This grows in very wet meadows Swan Lake, marsh east of Polson, Dayton.

Isoetes Howellii Eng. Abundant at Bigfork in overflowed flats. First collected by Prof. Cowles's party and referred to I. Bolanderi. Also by Fitzpatrick at Swan Lake.

Lycopodium Selago L. Lake McDonald, Umbach, Sperry Glacier and Blackfoot Glacier, alpine.

Lycopodium obscurum L. Belton.

Lycopodium complanatum L. Frequent in dark woods, Bigfork, Swan Lake, Belton, Gunsight Lake.

Selaginella rupestris var. densa (Rydberg Fl. Mont. 17 (1900) as species). This is common and varies directly into the type.

Selaginella rupestris var. Columbiana. Leaves and bracts rather abruptly contracted into a short awn. Stems diffuse and slender, much as in S. rupincola. Spikes sharply angled. Macrospores favose. Flathead Lake at Bigfork and Snake River, Idaho, near Weiser.

Taxus brevifolia Nutt. Sylva 3 86 t. 108 (1849). Yew. Ground Hemlock. This cannot be separated from the eastern T. Canadensis except by the very slightly looser sterile catkins. The habit is the same. It is separated from the T. baccata of Europe by the broader and blunter leaves. Our plant is a straggling or prostrate shrub 1-20 feet high, with trunk mostly less than an inch thick. Leaves dark green above and shining, lighter but not white below, narrowed at base, 13-25.5 mm. long, about 2 mm. wide, persistent, sharply acute at both ends, appearing flat, but convex above and concave below, with twisted petiole, the arrangement and color of upper side resembles that of Abies grandis, and the lower prostrate branches of which it is easily mistaken by the novice, especially since it often grows with the fir. The petiole is about 2 mm. long, the upper half being round except at tip, then it widens to an oblong and flat and adnate area which joins the leaf ridge of the twig as a prolongation of it. At maturity the narrow free part of the petiole breaks off irregularly, leaving a seeming and oblique knot simulating the cushion of the spruce, but has no scar at the tip as that does, because the leaf is not jointed to it there. The season's twigs are apple green, smooth, last season's twigs are reddish brown, the older ones browner, and at last flaking up in papery layers. The old bark of the main trunk is rather purplish beneath and flaky, like Thuya, but in few and short layers. It is a slow grower, with small rings; wood white with dark red center and inclined to be translucent, hard. The leaves are a kind of yellowish green color. The flowers for the next season form the fall before. This grows at Huckleberry Spring and along the Swan Lake road for half a mile or so; also at the Hemlocks, preferring damp and dark woods. Collected also by Elrod at the Hemlocks. The berries are red, juicy and sweet, with a resinous flavor, about 6.5 mm. long, soft and open at the tip, single in the axils. The branches with the leaves have the same flat, wand-like appearance of the fir and divide in much the same way, though they are more open and slender. It ranges northward and westward and in the Puget Sound region attains the dimensions of a tree. With us it is a low and straggling shrub forming dense thickets when several plants grow together, the branches matting down loosely with the snow. It is common in the mountains from Mission Creek to the British line and is a very bad shrub for mountain climbers because of its being so smooth and decumbent. McDonald Lake, Umbach.

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ABIES, FIR.

Our two firs have the bracts concealed, being shorter than the scales. The trees are spire-like, with short branches either horizontal or drooping. Twigs stout. Wood soft and rather brittle, while light in weight. Good for finishing lumber, but not good for general purposes, soon rotting; not as resinous as most wood in this family. The young bark is not roughened, white or light and full of mostly large transverse blisters containing liquid resin. The older bark is very thick and corky and not flaking up, but growing in thick ridges.

Abies amabilis (Loud.) Forbes. Blankenship is right in saying that this species does not grow in Montana, but it does not appear that Rydberg intended to say (Fl. Mont. p. 12) that it grows in the state. He seems to have inserted it and described it so that it might be looked for. Surfaces of leaves not differing greatly in color, rather light.

Surfaces of leaves not differing greatly in color, rather light. Tips of trees lang and needle-like. Cones nearly black. Mostly alpine on slopes. **A. lasiocarpa.**

Surfaces of leaves conspicuously different in color, the upper dark-green and glossy, the lower silvery. Cones greenish-brown. Trees of the low lands along streams. **A. grandis.**

Abies lasiocarpa (Hook) Nutt. Sylva 3 138 (1849), pinus lasiocarpa Hooker Fl. Bor. Am. 2 163 (1842), Abies subalpina Eng. and var. fallax Eng. Everywhere next to timber line on the mountains (though not seen on McDonald peak) where it grows not only along streams, but on slopes and mesas. There it forms the chief forest tree, from 50 to 100 feet high, though it is intermixed with the spruce and pine. The branches are short, stiff and ragged, mostly horizontal. It also occurs sparingly at Swan Lake and along the Swan Lake road with A. grandis. It is usually a tree about 2 feet in diameter, and the leaves, especially the upper ones are short, rarely over an inch long and often little flattened and angled. MacDougal peak, Umbach.

Abies grandis Lindley Penn. Cycl. 1 30 (1833). Great Silver Fir. This is frequent along streams and rivers and at springs and swamps in the low lands and upward as far as subalpine, where it is replaced by A. lasiocarpa. It never forms a conspicuous part of the forest though it is a picturesque tree. All the branches are much drooping. Bark without roughness, except the blisters, which are 13-19 mm. long. On trees over 6 inches thick the lower bark begins to get corky and split. All but the season's twigs reddish brown, these apple green and minutely pubescent. Scar circular and slightly raised. Bark of old trees near the base (which are 2-3 feet in diameter) is 2-3 inches thick and corky, but gray, and the lines of fissuring are not so wavy as in the red fir, the areas smaller. It occurs all around the lake and in all the canons; also at Hot Springs. Tree often 150 feet high. Not common in the Sperry Glacier region.

Pseudotsuga mucronata (Raf.) Sudworth Cont. Nat. Herb. 3 266 (1895). Abies mucronata Raf. Atl. Jour. 120 (1832), P. taxifolia Britton, P. Douglasii Carriere. This is very common in moist woods everywhere and on moist slopes almost to timber line, thus forming a large and valuable timber tree. It forms about half of the forests in this region, preferring the uplands and well drained slopes. The wood is reddish, compact and tough, and heavy, not easily rotting. Trees often 4 feet in diameter. The outline is oblong to oblanceloate, with a short triangular tip. Twigs inclined to be reddish. Leaves rather thin, petioled, flat, appearing rather 2-ranked by the bending of the petiole, rather dark green, leaving oval scars. The bark is very thick and deeply cracked much higher up the trunk than in the firs. The branches are slender and inclined to droop. Tree cone-bearing all over and not at the tip exclusively as in the firs. Easily distinguished from the firs by the pendulous cones and reddish twigs, and from the spruces by the absence of tooth-like cushions on the twigs, and by the presence of an exserted, 3-toothed tongue under each scale, and by the very thick and corky bark, which is thin and scaly in the spruces. This tree is beginning to be killed out at Bigfoot by a borer. Polson, Umbach. Not seen in the Sperry Glacier region.

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PICEA, SPRUCE.

Twigs smooth. **P. Columbiana.**
Twigs pubescent. **P. Engelmanni.**

Blankenship reports Picea alba Link from Belton and other localities, but all the plants so referred are P. Columbiana Lemmon, which replaces P. Parryana in our region.

Picea Columbiana Lemmon Gard. and Forest 10 183 (1897). White Spruce. Columbian Spruce. Whether this spruce can be separated from the P. alba of the east is still in doubt. The distinctions relied on by Rydberg do not hold, but the smooth twigs clearly separate it from P. Engelmanni, as well as its more narrow and spire-like outline of P. Parryi and habitat, which is that of the white spruce, namely along streams and in wet places, instead of slopes and mountain sides as in P. Engelmanni. The cones generally have entire and thick margined very broadly obovate scales and are narrowly elliptical before maturity. After opening they are elliptical and 1-1.5 inches long. The outline of the tree is lanceolate. Lower branches drooping and short. Twigs innumerable, white, shiny and smooth. Last year's ones tan colored and smooth, short and rigid, with the cushions not over 2-5 mm. high. All leaves very shortly apiculate, oblique at base and truncate. Bark of tree dark gray and rough to the twigs, lower bark scaly and thin, but the whole tree is without scaly bark up to 6 inches in diameter and is finely roughened all over. The tree is never blue like P. Parryi. It is seldom over 2 feet in diameter and often 100 feet high. The largest tree seen was 12 feet 9 inches around. It is not common, though it is found in all localities up to the subalpine. Kalispell, Williams, also Belton. Alta, Lake McDonald. Not on the Atlantic slope. Deer Lodge Valley.

Picea Engelmanni (Parry) Eng. Trans. St. Louis Acad. 2 212 (1863). Abies Engelmanni Parry same citation. Engelmann's Spruce. This is a tree with oblong outline and rather rounded top, mostly 50 to 75 feet high and 1-2 feet in diameter, much wider and shorter than P. Columbiana. The twigs are pendent, about a foot long. Leaves less rigid, spreading in all directions, acute, slender, mostly nearly straight, about 1 inch long. The cones are elliptical before opening, about 2 inches long and 1 inch wide, about a half longer than P. Columbiana, shortly rounded at both ends. Scales rather dark, straight, nearly entire in the type to somewhat lacerate, thin and with narrowed tips in ours, not evidently obovate. Twigs reddish and minutely pubescent. This is very abundant near timber line on all the peaks and on subalpine slopes is frequent. Elrod peak, Elrod. It is the only spruce on the Atlantic slope. The wood of both species is compact and hard and tough and nearly white and makes fine lumber. It is shipped as Oregon Fir all over the west. The bark is characteristic, being thin and very flaky and reddish, not forming thick ridges as in the firs, it exudes much resin, but there are few or no blisters as in the firs and is not smooth as in the firs. It is at once separable from Parry's spruce by the pubescent twigs and dark and short cones, while the twigs of the other are smooth, and the cones apple green and often 4 inches long, and the scales are thin and very lacerate, with narrow tips.

TSUGA, HEMLOCK.

The hemlocks are the most graceful and beautiful of the evergreens. Their tall and spire-like outline, with needle-like tip, and their long and drooping slender branches with quill-like twigs, 2-4 feet long pendent and dangling their clusters of cones in flat wands could be mistaken for the spruces by the casual observer. The trees are mostly 100 to 200 feet high and grow in dark and damp woods along rivulets at the bases of the mountains or alpine and are rare.

Plants of the Middle Temperate zone, cones .5-1 inch long. **T. Mertensiana.**
Alpine, cones 1.5-2 inches long. **T. heterophylla.**

Tsuga heterophylla (Raf.) Sargent Sylva 12 73 (1898), Abies heterophylla Raf. Atl. Jour. 119 (1832). Western Hemlock. This is a tree with the habit and appearance of the pyramidal forms of Juniperus scopulorum, and also

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Picea Columbiana, but the tip more needle-like, habit about that of Cupressus Arizonicus. The branches droop and the fruiting twigs are pendulous in clusters. It grows along with the firs, some trees being 50 to 60 feet high with us. The branches are very many, rather dense and with many twigs. Season's twigs barely 2 mm. wide, drooping as are also all the younger twigs of 2-3 years' age, very pubescent with spreading hairs, 2-6 inches long, round. reddish yellow, the convex leaf ridges 4.5 mm. long and ending in a dark red appressed and truncate cushion about as broad as long, to which the twisted and flattened leaf petiole, about 2 mm. long is jointed. Leaf blade 13 mm. long, 1 mm. wide, entire, flat, with one dorsal groove and low convex back, and concave lower side, very dark green above and glaucous below, apex obtuse and rounded, base triangular-acute and set at an angle to the petiole, smooth. Last season's twigs light-reddish brown, 3-year-old twigs reddish brown, with papery bark splitting between the leaf ridges and flaking up like birch bark, the leaf cushions falling off with them. Twigs that are 13 mm. thick also have reddish brown papery bark scaling up somewhat. The older bark scales up like the spruce, but is more shreddy, like the Arbor Vitae. Cones apple green, pendulous on twigs 1-2 inches long, about 1 inch long, 11 mm. thick, elliptical-lanceolate, acute, smooth and waxy, but apparently puberulent when young. Scales 13 mm. long, elliptical-oval, with very narrow and reddish and entire margins. Seeds very small, 2 mm. long. Wings 4 to 6 times as long and very thin and rounded. Bracts not visible in the green cones. Wood white and soft and very flexible, with red center. This is very rare in our region so far as known, A few individuals grow at the Hemlocks at the foot of MacDougal peak near Echo Lake and at Swan Lake. It also abounds in the Sperry Glacier region. It does not grow on the Atlantic slope.

Tsuga Mertensiana (Bong.) Carriere Trait. Conif. Nouv. Ed. 250 (1867). Pinus Mertensiana Bong. Mem. Ac. St. Pet. 6 2 45 (1832). Tsuga Pattoniana Eng. Black Hemlock. Leaves 13-25.5 mm. long, angular, acutish, narrowed below, often arched, keeled on both sides, unequal and appearing as if in clusters. Cones 1.5-2 inches long, cylindrical, 13-17.5 mm. thick. Seeds 5 mm long, with an obliquely abovate wing. This has been reported from the Sperry Glacier region, McDonald peak and Bitter Root mountains, but it is doubtful if it grows east of the Cascades. It has probably been confounded with the longer coned forms of the above. The Sperry Glacier species is not Mertensiana.

Blankenship in his additions to the Montana flora quotes Tsuga Mertensiana records from various Government reports as occurring on the high mountains. All these records are errors, for Picea Columbiana, whose cones resemble the Tsuga. No Tsuga grows at high elevations in Montana. They all belong to the Middle Temperate life-zone.

JUNIPERUS, JUNIPER, CEDAR.

Alpine shrubs mostly, tufted from the root and prostrate or widely spreading with sharp and prickly leaves about 12 mm. long. Berries in the axils. **J. communis.**

Not alpine. Leaves scale-like (sometimes needle-like in Virgiana).

Prostrate or decumbent at base, shrubs, **J. Sabina.**

Trees or shrubs, with distinct and erect trunks. Berries terminal.

Leaves with entire margins, in pairs. **J. Virginiana.**

Leaves with plainly denticulate margins, mostly in threes. **J. occidentalis.**

Juniperus communis L. 1040. The type is a small tree with a trunk, and does not occur with us.

Juniperus communis var. **depressa** Pursh Fl. 2 646 (1814). Depressed variety. This is the common form at low elevations growing in the open woods on flats where the stems are many from the root and decumbent at base and then ascending 3 to 4 feet high, forming a kind of bowl shaped mass 6 to 10 feet in diameter. Common all along the eastern side of the Lake in the Middle Temperate life-zone. Occasional in the Sperry Glacier region, especially on the Atlantic slope.

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Juniperus communis var. **montana** Ait. Hort. Kew 3 414 (1788). **J. Sibirica** Burgsti., **J. communis** var. alpina Wall. Alpine variety. This forms dense mats at and near timber line and is mostly prostrate throughout and usually has shorter and blunter leaves. The berries of both the varieties are blue with a white bloom and are barely edible. The species has little use in Montana, though the branches make good floors for beds. The plants have a strong odor when bruised and produce juniper oil in abundance when distilled. The berries form a portion of the food of grouse at high elevations and the mats form the best of shelter from enemies and the weather. It grows best on steep ridges and exposed slopes and cliffs. MacDougal peak, MacDougal; also Umbach. It is common.

Juniperus Virginiana L. 1039. Red Cedar. Red Juniper. This is the characteristic tree of the Lake shores, being found everywhere just at the storm line. It also grows on subalpine cliffs straggling over the rocks. Along the shores it occurs in two forms, the more common one being a bushy and rounded clump with one or more trunks 10 to 20 feet high growing on rocks or shallow soil. Where the soil is deep it assumes the proportions of a tree even 75 feet high and often pyramidal in outline. It varies in thickness from a few inches to almost 2 feet. The bark is rather thin and dark. The branches are smooth and olive colored and do not flake up at all for several feet in length, then they flake slowly, but not at all as in the variety which grows in more arid conditions and therefore flakes up more quickly. The inner bark is dull and the wood of the twigs white to the core. The spray is fine and open. Berries about 2 mm. wide and blue when ripe. The wood of the old trees has a narrow white band near the bark, the rest is dull red and not purplish as in the variety. The odor is strong and aromatic. The texture of the wood is compact, very fibrous and splitting into very slender splinters, very flexible, heavy. It makes the best of fire wood, good posts, is rarely large enough for lumber and is much used as an insect exterminator because of the strong odor. The bark of the main trunk is not evidently shreddy, but is deeply cracked in narrow ridges, and it never hangs in long shreds floating in the wind as on the white juniper. Where the bark cracks up on the twigs it does so in rectangular pieces, not in papery shreds. The distinction of rounded top separating this from the variety amounts to nothing. The ripening of the berries is indifferently annual or biennial, though in the typical species it is more nearly annual. The only distinction that amounts to anything between this and the variety is the finer spray, smaller berries and dull purple wood. Also at McDonald peak at 5,500 alt.; Wild Horse Island, Elrod; Bigfork, Umbach. Not seen in Sperry Glacier region.

Juniperus Sabina L. 1039. Creeping Juniper. This belongs to the Virginiana section and is creeping, flat on the ground for the most part. It grows on dry slopes, but does not seem to be nearer our region than the Atlantic slope, except at Garrison and Upper Marias Pass and Deer Lodge Valley.

Juniperus Virginiana var. **scopulorum** (Sargent Gard. and Forest 10 420 (1897) as species). This variety does not grow in the Flathead region unless it occurs on the west side on rolling hills. The wood is bright purple, the berries about 4.5 mm. wide, the spray much shorter and a little thicker, and the bark of the twigs flaking up except for a short distance near the ends into small blocks and leaving the purplish under bark exposed. It abounds on dry hills and cliffs where the rainfall is less than 20 inches per annum throughout eastern Montana and southward through Idaho. In Utah it is found only in the mountains on cliffs and slopes. It is mostly with rounded top, but is occasionally pyramidal, but rarely reaches 50 feet high then. The differences between the type and variety are only such as would occur in a moister climate. There is a Coast form of this plant along the Sound whose relationship is not yet fully established, but it is probably only the most developed form, due to better soil and still more humid climate.

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Juniperus occidentalis Hooker Fl. Bor. Am. 2 166 (1840). Western White Juniper. This has not yet been reported from our region, but is likely to grow west of the Lake on the dry hills. It is characterized by the thick twigs, large berries, compact spray, rounded apple tree-like top and very stout and erect trunk 1 to 2 feet thick, as well as by the leaves being in threes.

THUYA, ARBOR VITAE.

Thuya plicata Donn Hort. Cantab. Ed. 6 249 (1811). T. gigantea Nutt. Giant Cedar. Arbor Vitae. Cedar. This is a very tall and graceful tree, outline conical, or linear-subulate in cross section, with spreading and much drooping branches. The scale-like leaves green and shining, acuminate, rather pubescent. Comes clustered toward the ends of the twigs, 13 mm. long, the scales with a thin and acute mucro. Wood is fine grained, very flexible and soft, light colored, reddish at center, durable, splitting readily into fine flakes and much used for shingles. With us it is a slender tree rarely a foot thick and 100 feet high, growing on wet north slopes along with the larch and fir in the shade. The bark shreds up into long and thin flakes 1 to 2 feet long, which are reddish. The upper stems smooth and light brown. Branches many and slender. It is at once recognized by the scale-like leaves arranged on branches, forming great flattened wands, and by the cones. Huckleberry Spring, on the Swan River road. This is sold as white cedar by the lumbermen throughout Montana. Common at McDonald Lake in the Mission Mountains. Not seen on the Atlantic slope.

At both lakes there are magnificent forests with some trees 4 feet in diameter.

CHAMAECYPARIS, YELLOW CEDAR.

Chamaecyparis Nootkatensis (Lamb). Spach. Hist. Veg. 11 333 (1842). Cupressus Nootkatensis Lambert Gen. Pin. 2 18 (1824). This has been reported from near our region, but is probably an error for the Thuya.

PINUS, PINE.

Leaves less than 5 in each cluster. Bark rough.
- Leaves in twos, 2-3 inches long. Cones persistent for years, small, about 1.5-2 inches long, obliquely-triangular-ovate when closed. Slender trees with many and mostly whorled branches. **P. contorta.**
- Leaves in threes, rarely in twos, about 6 inches long. Cones oval 3-4 inches long, dark-purple. Branches seldom opposite, few, large. Very large trees **P. ponderosa.**

Leaves in fives. Bark smooth on all the upper part of trees, very resinous. Wood soft and white, rather brittle.
- Cones ovate to almost round, very dark, rarely 3 inches long. Low and scraggly trees growing in rocky places in subalpine situations. **P. albicoulis.**
- Cones nearly apple-green, cylindrical, 4-8 inches long.
  - Low and scraggly trees, widely branched. Leaves rigid, dark-green. Branches few and large. **P. flexilis.**
  - Tall and stately trees with slender, weak and light-green leaves. Bark oak-like. Branches whorled and many. **P. monticola.**

Pinus contorta Douglas in London Arb. Frut. 4 2292 f. 2210, 2211 (1838). What corresponds partly with the type of this species is a small and scraggly tree growing at timber line on McDonald peak, and probably elsewhere. It has small and very oblique cones not opening for several years after maturity and slender leaves 1 to 1.5 inches long. The type is a tree of the wet coasts of the Sound in a very different life zone. Upper Marias Pass, Lake Louise.

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Pinus contorta var. **Murrayana** (Murr.) Eng. Bot. Cal. 2 126 (1880), Pinus Murrayana Murr. Bot. Exp. Oregon 740 t. 3. f. 2. (1860). Lodgepole Pine. This is a strict and slender tree with tapering trunk, growing in dense thickets and singly all over the mountains to timber line in dry places, horizontal, slender, whorled branches. Cones clustered, about 2 inches long, with strong knobs and slender prickles. The bark is thin and scaly and light-brown, and rough even to the twigs, not conspicuously resinous. Leaves 2 to 3 inches long. Outline of tree is lanceolate with an acuminate tip. This is the most common evergreen in the region taking it as a whole. There are few places where it has reached the dimensions of a lumber tree because of the frequent fires, but back of Yellow Bay it forms immense thickets over square miles of land, growing so thickly that it is difficult to force one's way through it afoot. It is everywhere on the slopes of McDonald peak, is very abundant on the uplands back of Bigfork going up to the limit of the subalpine at 5500 feet. It is occasionally 150 feet high. The wood is tough, hard, compact and reddish, and when large enough makes fine lumber. It is much used for poles for fencing, for posts and the like. Everywhere to the top of the mountains in the Bitter Root valley. Occasional on both slopes in the Sperry Glacier region.

Pinus ponderosa var. **scopulorum** Eng. Bot. Cal. 2 126 (1880). Yellow Pine. This is a magnificent tree 100 to 150 feet high, with straight trunk tapering but little, the lower branches falling early and only here and there a great branch straggling off, trunk often 100 feet long without a branch and 2 to 6 feet in diameter, with brick-colored, thick, flaky bark cracking up into great flat areas 2 to 4 inches wide and a foot or more long. The very slender leaves are about 6 inches long in swabs at the ends of the twigs. The cones before opening are oval-olong, 3 to 4 inches long, but on opening are about oval-ovate, dark colored. Prickles stout and incurved. Wood rather yellowish, compact, tough, heavy. Leaves often in twos. The cones and leaves vary greatly. This is the great lumber tree of the region. It abounds on the mainland on tablelands and slopes to the subalpine at 5500 feet alt. in dry places and on all the shores and islands of the lake. It never grows in thickets, even the seedlings do not grow close together as with the lodge-pole pine. Bigfork, Umbach. Everywhere to the top of the mountains in the Bitter Root valley.

Pinus albicaulis Eng. Trans St. Louis Acad. 2 209 (1868). White-barked Pine. Bastard Alpine Pine. This grows at high elevations at and near timberline on all the mountains on the edges of rocky meadows and slopes and ridges. It is a scraggly tree, generally with the trunk dividing into two or more great limbs which are tortuous or curved and sparingly branched with short and thick twigs and smaller branches whose swollen bark is full of pitch. The leaves form narrow swabs at the ends. The nearly black cones are single to clustered near the ends, and are heavy but small. The main trunk is a foot or two thick with rather thin bark cracking into oblong areas flat on the top much like the oak. The wood is soft and white and full of resin and very brittle, of little value save for fuel. Trees rarely over 50 feet high growing along with the alpine fir and red fir. Common at timber line on both slopes in the Sperry Glacier region.

Pinus flexilis James Long's Exp. 2 35 (1823). Bastard Pine. This is not yet known nearer than Deer Lodge valley. Its cones are narrow and over twice as long as in albicaulis and the tree grows in the Middle Temperate life zone mostly but in other respects much resemble it.

Pinus monticola Douglas in Lamb. Desc. Pin. Ed 2, 3 27 t. 87 (1837). White Pine. This is the most magnificent pine of them all. It often grows to 200 feet high, with a straight symmetrical and clean trunk, with thin (except at base) and oak-like bark. It is often 6 feet in diameter but is still a slender tree. It has an airy apearance because of the rather long internodes and the almost thread-like and glaucous leaves 2 inches long.

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The cones are resinous, light but ofen 8 inches long, few and almost always at or near the tip of the tree. The bark is olive-gray and smooth on all the branches and even the trunk for many feet down. Bark of the main trunk below is light-gray, cracked into small rectangular and oblong areas 1 to 2 inches long which are not flaky and never over an inch thick and flat-topped. Outline of tree is linear with an acuminate tip. It branches like the lodgepole pine but is more open and with branches longer and flexible. It grows along the Swan Lake road sparingly in moist places and in the fir forests near the Hemlocks in the most magnificent proportions. It is remarkably free from knots. The wood is white and soft. It is considered the best timber tree of all, but is not plentiful. Not found on McDonald peak nor on any of the islands. Lake McDonald, Umbach. Locally abundant in the Lake McDonald region.

LARIX, LARCH, TAMARACK.

Alpine, twigs and bud scales woolly. **L. Lyallii.**
Plants of the Middle Temperate life zone. Twigs and scales smooth. **L. occidentalis.**

Though the larch differs superficially from Picea in a marked degree in the deciduous and fascicled secondary leaves, yet it is closely related to it in all permanent characters as is shown by the development of the young plants and the character of the primary leaves. Its arrangement with the pines is a wholly artificial one for ease in classification.

Larix Lyallii Parl. Enum. Sem. Hort. Reg. Mus. Fl. 259 (1863). Alpine larch. This tree grows at and near timber line on the high peaks. It is seldom 100 feet high and branches rather low down into one to three large and candelabrum-like divisions which are mostly erect above the curved base. The trunk is large for the height and straight, seldom making more than one length of good lumber. The bark and wood are much the same as in the western larch. It grows on rocky slopes and among glacial boulders, never in wet places. In our region it has not been found on the Flathead Lake side of any of the ranges but occurs on the eastern side of the Swan range in the alpine basins but sparingly. It has been found on Elrod peak, Mt. Lo Lo, also by Jones in the main range west of Hamilton. It also occurs on Mt. Haggin back of Anaconda and probably southwestward to the Sawtooth and Seven Devils mountains, Idaho and the Blue Mountains or Wallowas of eastern Oregon. It extends northward into British America and westward. Not seen in the Sperry Glacier region.

The following field study of Larix Lyallii growing on Como peak was made this year. Subalpine. Young trees much like L. occidentalis but more widely branched. Bark rough and cracking up into irregular and thick flakes like Pinus Murrayana on the base of trees that were only 4 inches thick. Upper bark light gray and smooth, powdery or granular. Two-year-old twigs the same in color and with thin hair-like flakes or fibrous shreds. Last year's twigs chestnut-colored and woolly. Season's twigs were woolly and green and with single leaves as in the other species. Regular leaves needle like and a little tapering at base, very soft, about an inch long. Cones erect even when the twigs are pendent. Scales erose and puberulent at tip, deep purple. Branches very slender and pendent often. Outline of old trees ovate. Branches large, dichotomously several times branched. Habit more that of Pseudotsuga but more open. Branches either ascending or drooping. Trunks sometimes forked and candelabrum-like, but mostly simple.

Larix occidentalis Nutt. Sylva 3 143 t. 120 (1849). Western Larch. Tamarack. The young season's branches have raised ridges along the stem like the spruce, which end abruptly in an oblique scar to which the primary leaves are jointed, but this scar is not horizontal at the end of a short and woody and persistent pedicel as in the spruces, but the leaves of both are single in a place like the firs. The second year the twigs

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are roughened by these now leafless ridges though otherwise smooth and are tan-colored. After the twigs are two years old they are covered by resinous particles like warts and are dark-gray or brown. The outline of the tree is linear-lanceolate and it appears sparsely branched with relatively very short branches which are often clustered in bunches, mostly alternately, and mostly drooping. Twigs either erect or pendulous. In young trees especially the twigs are often several feet long and droop like the weeping willow forming very beautiful and symmetrical trees. The tree is much infested with mistletoe which produces great knobs from which arise innumerable branchlets. Season's twigs about 2 mm. thick, dull-red, very slender, a few inches to a foot long as a rule, slightly pubescent, arising from the wart-like knobs of the previous year, except the terminal twig which arises from the bud of the previous year, but even it has at its base the rosette of secondary leaves which is characteristic of the knobs and also has the knob there. The second year the lateral buds of the first year produce rosettes of many leaves and also thicken into warty knobs about 6.5-9 mm. long and wide which persist in the stem indefinitely and give it its very knotty appearance. The third year these knobs develop twigs from the center and a second rosette of leaves at the base or produce sterile or fertile cones with a rosette of leaves at their base, or often produce only another rosette of leaves. The twigs of the season have the basal rosette leaves about 2 inches long, 6.5 mm. wide and 3 mm. thick, they are obtusely 4-angled, needle-like, but a trifle wider above and with a very short point at the rounded tip. These leaves gradually pass into the primary leaves of the twigs which are about 1 inch long above and nearly the same width throughout and with a short and aculeate tip. These leaves are alternate, one in a place, terminating a leaf-ridge which is exactly like hemlock (that is convex on the back and chestnut-colored, ending in a truncate projection which stands out its width above the end of its attachment where it is jointed squarely to the leaf which is sessile and without a petiole, and is deciduous, this projection after a year or two being only a knob in the bark and thus differing from the spruce). Therefore the larch and hemlock are the nearest related, and both are closely related to the spruce. The cones mostly fall when ripe but sometimes persist a year, especially when they produce a rosette of leaves at the tip which occurs frequently. Rarely they produce season's twigs from the tip and the upper and sometimes the lower bracts are altered into leaves, but with the center of the cone still seed bearing. The cones are 1-2 inches long, .75-1 inch wide, rounded at both ends. The bracts are tridentate and with the central tooth variously prolonged but the body of the bract is not exserted, bract red to purple at least at base. Scales nearly oval, about 9 mm. wide, the tips recurved a trifle and a little erose, about 13 mm. long. Wings of seeds half-ovate and as long as the scales, very thin, rounded. The cones ripened on Sept 1st, this season at Bigfork but at Coeur d'Alene Lake they were not ripe two weeks later though the elevation was much less, they seem to mature at once after frost. The bark of the older twigs is smooth and drab-colored except for the darker areas representing the old leaf-ridges which gradually widen and at last break into shallow cracks exposing the reddish under bark and letting the bark flake up in one thick layer. With age the bark gets rougher and more flaky and darker till the outer flakes fall off and leave it reddish. On the main trunk the bark is scaly and thin above, but on old trees it cracks into large and flat areas 2 to 4 inches wide and 6 to 18 inches long, reddish. The old trees have conspicuously brick-colored bark in great areas like the yellow pine but brighter. The tree is often 200 feet high, straight, with trunk tapering but little, the outline is linear-lanceolate. The branches are so small that they do not leave the wood knotty. The wood is rather reddish, soft, compact, finely grained and straight and splits readily in thin flakes. This tree forms about half

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of the forest of the eastern side of the Lake and by far the most lumber. The trees grow close together in dense forests and are often 4 feet in diameter. They prefer moist soil on north slopes or along bottoms and extend up to about 5500 feet altitude or the limit of the Middle Temperate zone. It is less common at Dayton, Hot Springs and McDonald peak than at Bigfork. Common in the Sperry Glacier region. Not seen on the upper Bitter Root.

Potamogeton Friesii Ruprecht. Polson Swamp.

Andropogon scoparius Mx. Dayton. This is the first time it has been reported west of the Atlantic slope.

Stipa minor (Vasey) Scribner. Common on low prairies Bigfork and Wild Horse Island.

Stipa Nelsoni Scribner. Monida, Alta, Blackfoot Glacier.

Agrostis exarta Trin. Alta, Belton.

Polypogon Monspeliensis (L.) Desf. Ravalli.

Calamagrostis neglecta (Ehrh.) Gaertn. Evaro, Alta.

Calamagrostis blanda Beal. Daphnia Lake at Bigfork. Too close to C. Canadensis.

Calamagrostis rubescens Buckley. Bigfork, Swan Lake, Bull Island.

Trisetum cernuum Trin. Bigfork, Swan Lake.

Trisetum canescens Buckley. Bigfork, Alta, Evaro.

Deschampsia calycina Presl. Ronan.

Spartina gracilis Trin. Polson.

Poa purpurascens Vasey. Sperry Glacier.

Poa reflexa V. & S. Sperry Glacier.

Poa alpicola Nash. Blackfoot Glacier.

Poa leptocoma Trin. Blackfoot Glacier.

Poa pudica Rydberg. Blackfoot Glacier.

Poa interior Rydberg. Sperry Glacier. A doubtful species.

Poa crocata Rydberg. Sperry Glacier.

Poa Lettermanni Vasey. Sperry Glacier.

Poa Howellii V. & S. Daphnia Lake at Bigfork.

Poa laevigata Scribner. Deer Lodge valley, Sperry Glacier.

Poa Nevadensis Vasey. Alta.

Poa brachyglossa Piper. Monida, Alta, Evaro.

Poa confusa Rydberg. Garrison.

Poa Olyneyae Piper. McDonald Lake Mission Mts., Darby.

Poa acuminata Scribner. Lambert Valley.

Poa annua L. Ronan, Missoula, Lake McDonald.

Glyceria elata (Nash Fl. Mont. 54 (1900) as Panicularia). Bigfork.

Glyceria pauciflora Presl. Ronan, McDonald Lake in the Mission Mts.

Glyceria borealis Piper. Swan Lake, Bigfork, Yellow Bay, Upper Marias Pass, Ronan.

Glyceria flavescens n. sp. This is close to G. grandis, but shorter and more rigid, stems 13 mm. thick at base, erect, 2.5-3 feet high not creeping at base. Even the upper sheaths nearly as long as the internodes which are short, making the stems very leafy. Upper leaves 6 to 12 inches long and nearly 13 mm. wide, shortly acuminate, smooth except on the scabrous edges, yellowish-green, a little paler below but not glaucous. Panicle scarcely exserted, obovate-cuneate, very dense, erect, with several erect rays at each joint which branch repeatedly, only the upper branches spreading. Spikelets linear-lanceolate, acute, about 11 mm. long, about 5-flowered, grennish-yellowish. Glumes hyaline, white, turning tawny with age, the upper 3-nerved at base. Lemma narrower and a trifle longer and less scabrous than in G. grandis, not turning purple. This has the habit of Phragmites and grows in large patches in bogs. Gathered at Swan Lake Aug. 24, 1908 while G. grandis at the same place was all out of bloom and even the seed fallen two weeks earlier. It differs from G. grandis in the swab-like panicle, lutescent flowers and leaves, broader

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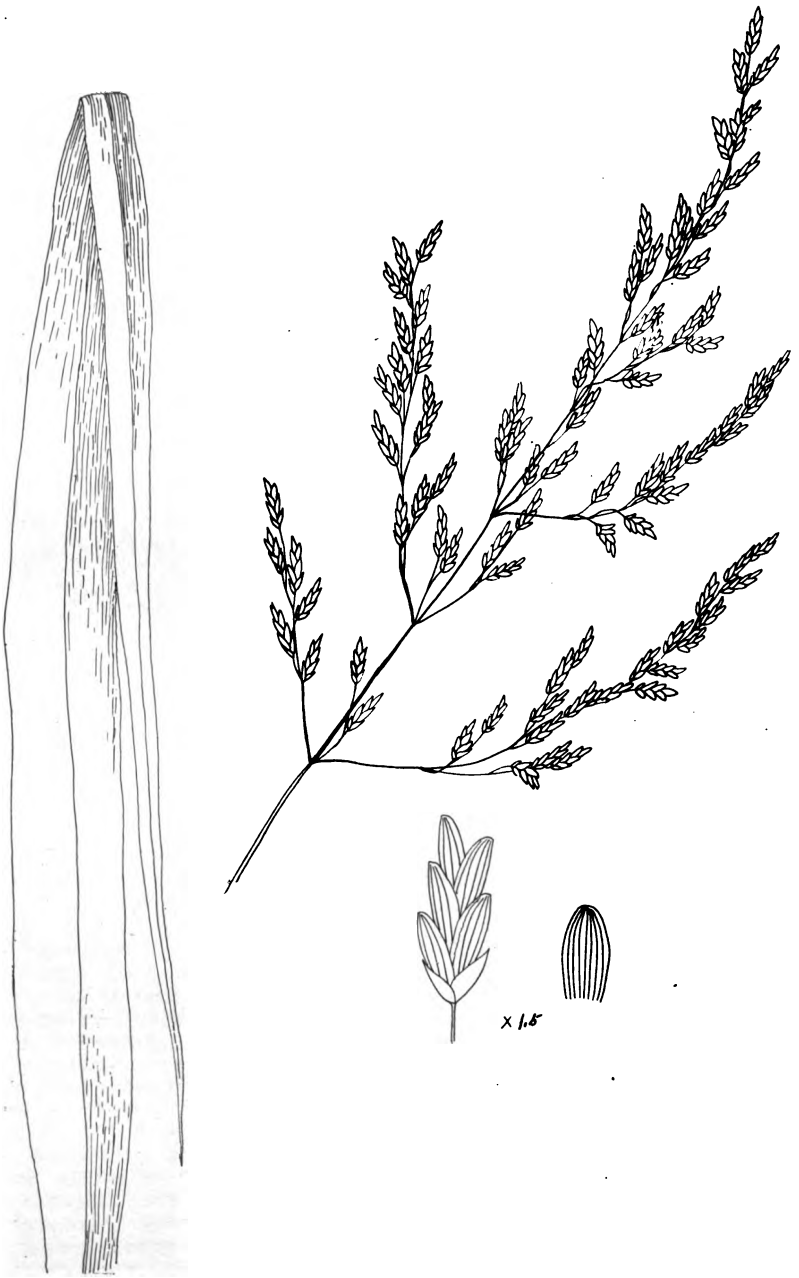
PLATE II.



GLYCERIA FLAVESCENS JONES N. S.

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PLATE III.

CAREX STANTONENSIS JONES
N. S.

CAREX PARRYANA VAR HALLII
BAILEY

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and shorter leaves, short internodes and very leavy stems, and much later flowering season. Middle Temperate life zone.

Festuca Hallii (Vasey) Piper. Bigfork, MacDonald peak.

Bromus Pumpellianus Scribner. Alta. Blackfoot Glacier, Bigfork.

Bromus Richardsoni Link. Bigfork, Swan Lake, Ravalli. Also the var. pallidus (Hook.) Shear, MacDougal and McDonald peaks, Wild Horse Island, Whitefish and Bigfork.

Bromus tectorum L. Missoula, Colville.

Bromus marginatus Nees. Bigfork, St. Ignatius Mission, Ronan, Ravalli Alta, McDonald Lake in the Mission Mts.

Melica stricta Bolander. Blackfoot Glacier.

Melica bella Piper. Alta.

Agropyron occidentale Scribner. Bigfork, Ronan, McDonald Lake in the Mission Mts., Upper Marias Pass, Browning.

Agropyron lanceolatum S. & S. Wild Horse Island.

Argopyron biflorum (Brign.) R. & S. Alta.

Argopyron Scribneri Vasey. MacDougal Peak.

Elymus triticoides Buckley. Ravalli, Blackfoot Glacier, Browning, Upper Marias Pass.

Elymus glaucus Buckley. Ravalli.

Elymus Canadensis L. Bigfork, St. Ignatius Mission, Yellow Bay, Wild Horse Island, Upper Marias Pass.

Scirpus riparius (R. Br.) Spreng. Monida.

Scirpus robustus Pursh. Bigfork, Hot Springs, St. Ignatius Mission.

Scirpus microcarpus Presl. Darby.

Scirpus microcarpus var. **robrotinctus** (Fernald Rhodora 2 20 (1900) as species. This hardly deserves varietal rank, all sorts of intergrades occur constantly. Alta, Bigfork, Swan Lake, St. Ignatius Mission, Hot Springs, Polson Swamp, Bull Island, Common.

Eriophorum gracile Roth. Sperry Glacier.

Eleocharis rostellata Torr. Hot Springs.

Carex Deweyana var. **sparsiflora** Bailey. Yellow Bay in damp and dark woods.

Carex nardina Fries. This plant is very common on all the alpine peaks and rocky meadows of the Sperry Glacier region, and in Lambert Valley in the Mission Mts. Though it agrees with other material from the Cascades sent out by the Gray Herbarium, it does not accord with the usual character given this species. In case it should prove distinct it may bear the name **Carex Stantonensis.** Densely caespitose, with many large and brown sheaths like C. filifolia, and with thick crowns. Root leaves many, filiform, channeled, smooth, truncate, rigid, erect, .5 mm. wide, about 4 inches long and as long as the stems which are filiform. Spike single, inclined to be clavate and narrowed below, but acute at tip. The two lowest perigynia contiguous, the rest imbricated closely. Spike staminate at tip and with few stamens, 13 mm. long, 5 mm. wide. Bracts none. Scales ovate-oval, acute, fully 2 mm. long, chestnut-colored but with lighter midrib, closely investing the perygynia and fully as wide, very thin, with entire edge. Perigynia closely appressed but with tip inclined to turn out, manifestly inflated and with papery covering, about a third longer than the akene and inclined to wrinkle lengthwise as if nerved, tip a little oblique, with very short oblique beak, not cleft down the outside to speak of and nearly entire. Perigynia white except the chestnut-colored tip, about as long as the inflated scale, smooth except the scabrous edges above and near the tip on the back, apparently plano-convex, not winged, oblong-ovate. This is manifestly a close ally to C. Lyoni but differs in the much broader scale, while the perigynia are wanting in the mature state. It is also near to C. rupestris but the stigmas are two and not three and the perigynia are not smooth above as in that species. Collected by Williams on a mountain above Stanton Lake, Aug., 1894 and distributed as C. Pyrenaica.

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Carex gravida Bailey. Swan Lake.

Carex conjuncta Boott. Polson Swamp, Whitefish, Sand Point, Idaho.

Carex diandra Schrank. Ours is the var. **ramosa** (Boott) Fernald. Bigfork, Swan Lake, Rost Lake, Ronan, Alta.

Carex stenophylla Wahl. Upper Marias Pass, Deer Lodge Valley.

Carex scirpoides Schkr. Bigfork, Swan Lake, MacDougal peak.

Carex scoparia Schkr. Evaro.

Carex Liddoni Boott. Garrison, Alta, Evaro.

Carex adusta Boott. Ronan.

Carex leptalea Wahl. Bigfork, Rost Lake, Swan Lake, Bull Island, Yellow Bay.

Carex scirpoidea Mx. Lambert Valley, rather common in the Sperry Glacier region.

Carex aquatilis Wahl. Polson Swamp, Monida, Whitefish, Silver Bow.

Carex rigida Good. Lima, Monida.

Carex lenticularis Mx. Bigfork, Swan Lake, Sand Point, Idaho.

Carex acutina Bailey. Blackfoot Glacier,, Alta, Swan Lake.

Carex Nebraskensis Dewey. Evaro, Ravalli, Bigfork, Yellow Bay, Hot Springs, Monida.

Carex Parryana Dewey var. **Hallii** (Olney) Rydberg. Whether this is a good species I am not able to say at present. Prof. Bailey also regarded it as a variety of C. Parryana and called it var unica. A detailed description of it is appended.

This appears to be near C. Pennsylvanica. Stems leafless except at very base, 1 foot high, smooth, obtusely-3-angled, filiform, 1 mm. thick, erect and stiff, light-green. Leaves several basal, 3 inches long, 4 mm. wide at base, linear-subulate, yellowish-green, flat, rigid. Bracts enlarged, chestnut-colored and scale-like at base, sheathing, the lowest with a setiform green bristle about 1 inch long below the lowest spike, the others much reduced but present. Terminal spike 19 mm. long by 2 mm. wide, sessile, all staminate, with oval mostly obtuse scales which have broad hyaline, and lacerated edges and chestnut-colored center, 2 mm. long. Pistillate spikes contiguous, about 3, the uppermost at base of the staminate one and very small and few-flowered, 4.5-6.5 mm. long, 2 mm. wide, sessile, the others longer, 13-19 mm. long and 6 to 15 flowered, loose and cery narrow, 2 mm. wide, the scales reaching about to the middle of those above on the lower part of the spike. Lowest spikes on filiform peduncles but erect, the peduncles not longer than the spikes except when the lowest spike is subradical, when the peduncle is 3 to 4 inches long. Scales very broadly ovate, barely acute to cuspidate, dark-chestnut-colored, with white and hyaline edges, about 2 mm. long, embracing the oval, very convex and smooth (but papillose with oblong bosses) perigynia, which are abruptly contracted at both ends to a short beak or stipe, faintly-several-nerved, tip with serrate edges, mostly green, 1.5 mm. long. Monida on dry prairies. Middle Temperate life zone. This differs from C. Parryana in the sheathing bracts and smooth appearing perigynia, etc.

Carex Pennsylvanica Lam. Alta.

Carex Pennsylvanica var. **pinicola.** Leaves 11-15.5 mm. wide. Pistillate flowers more numerous, plants more robust. Alta among pines on dry hillsides. Middle Temperate life zone.

Carex Idahoa Bailey. Monida, Butte, Ryan's Lake.

Carex polygama Schkuhr. Rost Lake, Monida, foot of MacDougal peak.

Carex atrata L. Sperry and Blackfoot Glaciers.

Carex atrata var. **ovata** (Rudge) Boott. Sperry and Blackfoot Glaciers. Ours answer well to C. chalciolepis but are not all copper colored.

Carex Mertensii Prescott. Blackfoot Glacier.

Carex alpina Swartz. Sperry Glacier, McDonald Lake in the Mission Mts., Darby.

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Carex physocarpa Presl. Bigfork, Evaro, Alta, Ravalli.

Carex vesicara L. Bigfork, Polson Swamp, Alta.

Carex monile Tuck. Common at Bigfork, Polson Swamp, Monida, Hot Springs.

Carex retrorsa Schw. Bigfork, Rexford.

Carex retrorsa var. **Hartii** (Dewey) Gray. Polson Swamp and Swan Lake.

Carex lurida Wahl. Bigfork, Swan Lake.

Juncus Balticus var littoralis Eng. Wild Horse Island, Polson Swamp.

Juncus Drummonlii E. Meyer. Common in alpine meadows and on rocky ridges, MacDougal peak, McDonald peak, and on all the peaks of the Sperry Glacier region.

Juncus Drummondii var. **Parryi** (Eng. Rev. Junc. 446 (1866) as species). Como peak, McDonald Lake, Mission Mts.

Juncus triglumis L. Sperry Glacier.

Juncus Dudleyi Wiegand. This is one of the few segregates from J tenuis that seems to hold. Bigfork, St. Ignatius Mission, Sand Point, Idaho.

Juncus Greenei Oakes. Whitefish.

Juncus tenuis var. **anthelatus** Eng. Darby.

Juncus castaneus Smith. Blackfoot Glacier.

Juncus acuminatus Mx. Polson Swamp and Sand Point, Idaho.

Juncus alpinus Vill. J. truncatus Rydberg. Ours is the var. insignis. Common on the flats all around Flathead Lake and Swan Lake.

Juncus Nevadensis Wat. Alta, Hamilton, Wild Horse Island, Polson Swamp.

Juncus Columbianus Coville. Browning.

Luzula spicata (L.) Dec. Gunsight Pass and Sperry Glacier.

Luzula parviflora (Ehrh) Desv. Lambert Valley.

Luzula Piperi (Coville in Piper Fl. Wash. (1906) as Juncoides) Alpine meadows, MacDougal peak, Sperry Glacier, Alta.

Acorus Calamus L. Abundant at Polson Swamp and adjacent mainland, if introduced it must have been long ago.

Xerophyllum tenax (Pursh) Nutt. This abounds on all the mountains from Alta and the Mission mountains northward. It includes X. Douglasii Wat. There is great variability in the flowers.

Tofielda glutinosa (Mx.) Pers., **T. intermedia Rydberg.** Sperry Glacier.

Tofielda palustris Huds. Gunsight Pass and Lake.

Stenanthium occidentale Gray. Blackfoot Glacier and Gunsight Pass.

Zygadenus elegans var. **Coloradensis** (Rydberg Torr. Bull. 27 524 (1900) as species). Z. alpinus Blankenship. This intergrades freely with the type. Common mostly in alpine places, MacDougal peak and all through the Sperry Glacier region.

Zygadenus venenosus Wat. Frequent in all sorts of places and elevations. MacDougal and McDonald peaks, Wild Horse Island, St. Ignatius Mission, Yellow Bay, Polson, Bull Island, Bigfork, Evaro, Alta, Ronan, McDonald Lake in the Mission Mts. The segregates of Rydberg have no standing whatever.

Veratrum viride Ait. MacDougal and McDonald peaks, throughout the Sperry Glacier region, Upper Marias Pass, McDonald Lake, Mission Mts. This is the only Veratrum in the region though V. Californicum has been reported.

Allium Schoenoprasum var. **Sibiricum** (L.) Hartm. This hardly deserves varietal name as both forms grow together. Gunsight Pass and Lake, Belton, Upper Marias Pass.

Allium fibrosum Rydberg. Rydberg was right in separating this from A. reticulatum. Daphnia Lake, Lima.

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Allium reticulatum Fraser. Common along the upper Missoula river.

Smilacina sessilifolia (Baker) Nutt. Bigfork, St. Ignatius Mission, Yellow Bay, MacDougal and McDonald peaks, Bull Island and Wild Horse Island, Alta, Upper Marias Pass, Sperry Glacier.

Smilacina stellata (L.) Desf. Bigfork, Alta.

Smilacina amplexicaulis Nutt., **Vagnera brachypetala** Rydberg. Common at Bigfork, Yellow Bay, Wild Horse Island, Bull Island, St. Ignatius Mission, Ravalli, Evaro, Alta, Gunsight Lake, Upper Marias Pass.

Disporum trachycarpum (Wat.) B. & H. Somers, Bigfork, Yellow Bay, throughout the Sperry Glacier region.

Disporum Oreganum (Wat.) B. & H. Somers, Bigfork, Yellow Bay, Ravalli, Evaro, McDonald Lake, Mission Mts.

Streptopus amplexifolius (L.) DC. St. Ignatius Mission, McDonald peak, Swan Lake, Missoula, Alta, Sperry Glacier, Gunsight Lake.

Habenaria leucostachys (Lindl.) Wat. Alta. Common in the Sperry Glacier region.

Habenaria obtusata (Pursh) Rich. Foot of MacDougal peak, Mrs. Clemens.

Serapias gigantea (Dougl.) A. A. Eaton, Epipactis gigantea, Dougl. Swan Lake at Bond's Cabin and Jeff's Cabin. First found by Miss Norton. The writer doubts the wisdom of referring this to the genus Serapias.

Spiranthes Romanzoffiana Cham., **Gyrostachys stricta** Rydberg. MacDougal peak, Bigfork, Yellow Bay, Wild Horse Island, Bull Island, McDonald peak, Gunsight Lake, Alta, Evaro.

Listera cordata (L.) R. Br., L. **nephrophylla Rydberg.** McDonald Lake, Mission Mts.

Listera convallarioides (Swartz) Torr. Bigfork, Swan Lake, MacDougal and McDonald peaks, Yellow Bay, from Lake McDonald to St. Mary's Lake in the Sperry Glacier region.

Salix Babylonica (L.) This grows in graveyards.

Salix cordata Muhl. Common at low elevations in all localities.

Salix Novae-Angliae And. Lima.

Salix Novae-Angliae Var. **pseudocordata And.** Alta, Lambert Valley, Blackfoot Glacier and Sperry Glacier.

Salix monticola Bebb. Evaro, Alta, Browning.

Salix Scouleriana Barratt. Common all around Flathead Lake nearly to the upper edge of the Upper Temperate life zone, Columbia Falls.

Salix glaucops var. **glabrescens And.** MacDougal peak.

Salix Tweedyi (Bebb) Jones. This is reported from Flathead Pass, (Upper Marias) by Blankenship, but diligent search there fails to reveal it though the following is common there.

Salix Barclayi And. Upper Marias Pass and Sperry to Blackfoot Glacier especially on the Atlantic slope. It is a curious fact that willows are relatively scarce on the Pacific slope but the moment we get on the other slope they form the chief mountain vegetation forming almost impenetrable thickets, even though the humidity is less than on the west.

Salix Barrattiana Hook Specimens gotten by Williams at Columbia Falls on the high peaks seem to belong here.

Salix chlorophylla And. Gunsight Lake.

Salix polaris Wahl. Sperry Glacier.

Salix reticulata L. **S. saximontana Rydberg.** This very variable willow abounds on MacDougal to McDonald peaks, also throughout the Sperry Glacier region, Monida, Lambert Valley. Ours are the var. nivalis mostly.

Salix Fernaldi Blankenship. Blankenship seems to be right in making a species of the western forms of S. vestita. It is characterized by the ovate pods being 2 to 3 mm long only, and the leaves not retuse but rounded at tip. The other characters given amount to nothing, particularly the pubescence and reticulation of the leaves. Young leaves sometimes show little

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reticulation but old ones are remarkable for it. This is frequent throughout the high peaks.

Salix desertorum Rich. Gunsight Pass.

Salix candida Fluegge. Rost Lake and Schultze's cabin.

Salix rostrata Rich. Common everywhere almost to the alpine.

Salix macrocarpa Nutt. Bigfork, Swan Lake, McDonald peak, Hot Springs, Monida, Lima.

Salix pellita And. MacDougal peak, Swan Lake, Blackfoot and Sperry Glaciers. Blankenship in his Supp. Fl. Mont. p. 46 says that S. bella Piper is a segregate from S. Sitchensis (namely is S. pellita), but this is an error, it is a form of S. glaucops with two stamens. Cusick has at last solved the relationship of S. pellita by finding that it always has one stamen and is therefore the inland representative of S. Sitchensis as suggested in my Willows p. 25.

Salix nigra has been reported from this region but all specimens so referred are **S. lasiandra.** The same is true of **S. amygdaloides.**

Salix lasiandra Benth. This is common around Flathead Lake, especially on the shores, also St. Ignatius Mission, Ronan, Alta, McDonald Lake in the Mission Mts. mostly the var. **lancifolia.**

Populus trichocarpa T. & G. This seems to be the only narrow-leaved cottonwood west of the Atlantic slope. All forms so far reported as **P. balsamifera** are this species. The only characters that seem to hold are the 3-valved pod and hairy surface, but even the latter apparently does not hold in all cases. The species abounds at low elevations everywhere.

Populus deltoides Marsh. Flathead Delta, Thompson's Falls, Bonner's Ferry, Idaho. Ours is the var. **occidentalis** with smaller leaves.

Betula glandulosa Mx. In the Torrey Bulletin for August, 1909, Mr. B. T. Butler, who was at Bigfork a few weeks in 1908 and a short time in 1909, creates several species from this and B. microphylla out of very small amount of material and from very little field study, amounting to descriptions drawn from single trees, none of which species are tenable. His segregates from B. glandulosa are B. glandulifera Butler, B. Elrodiana Butler, B. crenata Rydberg. To these might be added B. Hallii Howell. B. glandulosa varies in size and leaves according to exposure and moisture where it grows. It abounds at the cold lakes at low elevations and on up to the alpine meadows on all the mountains from Alta in the far south to the Sperry Glacier region.

Betula microphylla Bunge. The typical form of this grows in Deer Lodge valley. The common form is var. **occidentalis** (Hooker Fl. Am. 2 155 (1839) as species). This has again been the subject of much unnecessary dissection such as B. fontinalis Sargent, B. Sandbergii Britton, B. Utahensis Britton, B. Piperi Britton. It is characterized by the chestnut-colored bark till quite old, which does not peel up in thin flakes, the cambium layer not separating from the tree readily when cut, and by the tufted habit, growing in clumps from a single root. In Utah and the drier regions it rarely reaches 20 feet high and is very slender, but in the more moist places in Montana, especially along creeks it is often 30 or rarely 40 feet high and 6-8 inches through. I have seen a few trees a foot thick in deep woods where the bark peals up tardily and simulates forms of B. alba. It is almost never seen except along creeks and at springs. The shape of the bracts amounts to nothing. It is common in our region and east at least as far as Helena, and south to southern Utah.

Betula alba L. Mr. Butler takes up the paper birches and recognizes every name ever applied to them but one as distinct species almost, such as B. Alaskana Sargent, and B. papyrifera Mx. The paper birches are at once recognized by growing singly from the root and forming large trees, or at least are not tufted as in the other species. The cambium layer pops off as soon as cut through carrying the rest of the bark with it. It grows indifferently along creeks, lake shores and in dark woods in wet places.

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The typical form has the bark flaking up in thin and papery white sheets even in young trees. It is very common throughout the region to St. Mary's Lake on the Atlantic slope east of Blackfoot Glacier.

Betula alba var. **pendula** (Roth Fl. Ger. 1 405 (1788) as species). Mr. Butler again dissects this and makes new names out of forms such as B. subcordata Rydberg, B. Montanensis Butler, and curiously refers B. occidentalis Hooker to it, when the typical form of it is described as low and shrubby. (See DC. Prod. 16 2). His B. Montanensis is founded on a single old and partly dead tree. This shades by imperceptible degrees into the type. It is characterized by the bark peeling off more tardily and in rather thick and cardboard-like layers. This also is common in our region. This is called B. occidentalis by Blankenship in his Supp. Fl. Mont. 48.

Alnus incana (L.) **Willd.** This is very common from Alta to the Sperry Glacier region along creeks and lake shores at low elevations. The var. virescens Watson has been reported from Flathead Lake but diligent search fails to reveal it though it is common east and south but out of our range.

Alnus crispa (Dryand) Pursh. This is the A. viridis and A. Alnabetula of most writers. It is rather common on mountain sides in subalpine places going up to alpine meadows, from Alta to the Sperry Glacier region.

Oaks have been reported from our region but every case proves to be wrong so far.

Urtica gracilis Ait. Frequent in wet woods and along creeks under Willows from Alta to Gunsight Lake.

Urtica Breweri Wat. has been reported from our region but all specimens prove to be the above.

Arceuthobium Douglasii Eng. This grows on the red fir making the twigs spindle out and droop like the weeping willow, and in large tufts, it aborts whole limbs. The tufts are 4-6 feet wide and 2-3 feet thick. The parasite runs along under the bark and breaks out at the joints. It seems to bloom early in the spring, as next season's buds were forming in July. It is very common throughout our region but good fruit is seldom seen.

Arceuthobium Douglasii var. **Tsugensis** (Rosendahl Minn. Bot. Stud. 2 2 273 (1903) as Razoumofskya). This has not yet been found in our region but is to be expected on the hemlock.

Arceuthobium Douglasii var. **Laricis** (Piper Fl. Wash, 223 (1906) as Razoumofskya). This is also very common but is seldom seen in fruit. It acts in the same way as on the red fir as to aborting branches but the tufts are rigid and very knotty, and twigs are thickened, short and rigid and congested in small tufts 2-3 feet wide and a foot thick. The stems are thicker and longer on the parasite than in the type. McDonald Lake in the Mission Mts., Bigfork and Yellow Bay, both in flower and fruit, Aug. 12, 1908.

Arceuthobium Americanum Eng. Alta, on Pinus Murrayana.

Comandra umbellata var. **pallida** (DC.) Jones. Common on dry prairies and on dry mountain slopes from the Lower Missoula river to Browning.

Polygonum minimum Wat. McDonald peak and Mission Creek, also Sperry Glacier to Gunsight Pass and Lake, subalpine.

Polygonum Douglasii Greene. Common in dry and gravelly places from Alta north and east.

Polygonum polygaloides Meisner. Upper Marias Pass.

Polygonum bistortoides Pursh. Frequent on all the high peaks, also at Evaro and Mission Creek.

Polygonum viviparum L. Lambert Valley, Sperry Glacier to Gunsight Pass.

Polygonum Pennsylvanicum L. Bigfork, Echo Lake.

Polygonum Persicarioides HBK. Darby.

Polygonum Persicaria L. St. Ignatius Mission.

Polygonum punctatum Ell. Polson Swamp, St. Ignatius Mission.

Polygonum Hydropiper L. Polson Swamp.

Polygonum alpinum All. Como Peak.

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Rumex pauciflorus Nutt. Monida, Evaro, Gunsight Pass.

Rumex occidentalis Wat. Swan Lake, Ronan, Alta, Browning.

Rumex crispus L. Common at low elevations from Alta northward.

Rumex salicifolius Weinm. Frequent along streams from Alta northward.

Rumex Persicarioides L. Frequent on the lake shores, also Hot Springs, Swan Like, St. Ignatius Mission, Whitefish, Browning.

Eriogonum multiceps Nees. Garrison and Monida.

Eriogonum ovalifolium Nutt. This is the alpine form E. nivale (Canby). Small. Common on all the high peaks.

Eriogonum ovalifolium var. **proliferum.** Wat. Alta.

Eriogonum umbellatum var. **stellatum** (Bth.) Jones. Alta.

Eriogonum umbellatum var. **subalpinum** (Greene) Jones. Alta, Gunsight Pass and Blackfoot Glacier, Summit.

Eriogonum flavum Nutt. Browning.

Eriogonum flavum var. **androsaceum** (Bth.) Jones. This should include E. Piperi Greene. Common on all the high peaks and very variable in the stipe.

Chenopodium hybridum L. Bigfork, Ravalli.

Chenopodium album L. Common from Polson to Bigfork and Browning.

Chenopodium glaucum L. Common on dry flats from the Hot Springs to Browning.

Chenopodium Botrys L. Ravalli.

Chenopodium rubrum L. Bigfork, Alta.

Atriplex truncata (Toor.) Gray. Common on the Little Bitter Root.

Atriplex Nuttallii Wat. Hot Springs and the Little Bitter Root.

Monolepis chenopodioides (Nutt.) Moq. Bigfork, St. Ignatius Mission, Dayton, Bull Island, Ronan, Alta.

Suaeda depressa (Pursh) Ledebour. Hot Springs and Polson.

Salsola Kali L. Common in waste places throughout at low elevations.

Amarantus graecizans L. Common in fields at low elevations.

Amarantus blitoides Wat. Ronan.

Amarantus retroflexus L. Common in fields at low elevations.

Oxybaphus angustifolius Sweet. Garrison.

Sagina Linnaei Presl. Lambert Valley, Sperry Glacier.

Arenaria tenella Nutt. MacDougal and McDonald Peaks, Lambert Valley, McDonald Lake Mission Mts., Sperry and Blackfoot Glaciers.

Arenaria verna var. **rubella** (Wahl.) Hook. MacDougal Peak.

Arenaria Nuttallii Pax. Lambert Valley.

Arenaria Sajanensis Willd. McDonald Peak, Elrod Peak (Elrod), Lambert Valley, Sperry and Blackfoot Glaciers.

Arenaria Fendleri Gray. Upper Marias Pass, Alta.

Arenaria aculeata Wat. Alta. This is probably only a form of A. congesta.

Arenaria congesta Nutt. Wild Horse Island, Alta.

Arenaria congesta var. **subcongesta** Wat. var. lithophila Rydberg. Alta, also reported from MacDougal Peak by Umbach.

Arenaria capillaris Poir. MacDougal Peak, Sperry to Blackfoot Glacier, also Elrod Peak (Elrod) and Swan Lake, MacDougal Peak (Miss Norton).

Arenaria capillaris var. **ursina** Rob. MacDougal and McDonald Peaks, also by Elrod.

Arenaria lateriflora L. Missoula and Swan Lake (Elrod).

Arenaria macrophylla Hook. Alta.

Stellaria calycantha Bong. McDonald Lake in the Mission Mts.

Stellaria borealis Bigelow. Alta, also var. **corallina.** Missoula (Elrod).

Stellaria umbellata Turcz. Sperry Glacier.

Stellaria longifolia Muhl. Alta. Missoula and Swan Lake (Elrod).

Stellaria longipes Goldie. Alta. Lolo (Elrod), Columbia Falls (Williams).

Stellaria longipes var. **Edwardsii** (R. Br.) Wat. Bigfork, Alta, Upper Marias Pass.

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Stellaria longipes var. **laeta** (Rich.) Wat. Common in meadows at low elevations.

Stellaria nitens Nutt. Columbia Falls (Williams).

Cerastium nutans Raf. Alta.

Cerastium alpinum L. var. **Beeringhianum** Regel. Bigfork, MacDougal and McDonald Peaks, Yellow Bay, Dayton, Wild Horse and Bull Islands, Alta.

Cerastium alpinum var. **Fischerianum** T. & G. MacDougal and McDonald Peaks, Sperry to Blackfoot Glacier.

Cerastium arvense var. **Fuegianum** Hook. Sperry Glacier.

Cerastium arvense var. **oblongifolium** Hollick & Britton. Sperry Glacier, Mission Creek, Lake McDonald, Mission Mts.

Silene conubalus Wibel. Ravalli.

Silene Douglasii Hook. Common in the mountains at all elevations.

Silene Douglasii var. **viscida** Rob. MacDougal and McDonald Peaks, common.

Silene Douglasii var. **brachycalyx** Rob. Blackfoot Glacier.

Silene Scouleri Hook. Alta.

Lychnis Drummondii (Hook.) Wat. Browning.

Lychnis apetala L. Blackfoot Glacier.

Agrostemma Githago L. Bigfork.

Dianthus Armeria L. Ravalli. Perfectly established.

Portulaca oleracea L. Bigfork.

Lewisia pygmaea (Gray) Rob. Gunsight Pass, Sperry Glacier (Umbach).

Montia perfoliata (Donn) Howell. Evaro, Bigfork. The parviflora form Lambert Valley.

Montia parvifolia (Moc.) Greene. Lambert Valley, Sperry to Blackfoot Glacier.

Montia linearis (Dougl.) Greene. Alta, Ronan. Missoula (Elrod).

Claytonia megarrhiza (Gray) Parry. MacDougal Peak, Sperry Glacier.

Claytonia lanceolata Pursh. Lambert Valley, McDonald Lake in the Mission Mts., Missoula (Elrod).

Nymphaea polysepala (Eng.) Greene. Common in shallow lakes and near the shores of Flathead Lake from Alta northward.

Ranunculus multifidus Pursh var, **terrestris** Gray. Bigfork, Alta.

Ranunculus Purshii Rich. This is reported from our region but no valid specimens seen.

Ranunculus Flammula L. var. **intermedius**. Hook. Common on all the shores of Flathead Lake, also from Lake McDonald to St. Mary's Lake.

Ranunculus Pygmaeus Wahl. Sperry Glacier, Como Peak.

Ranunculus eximeus Greene. McDonald Lake Mission Mts. Not distinct from the following.

Ranunculus Eschscholtzii Schl. Lambert Valley, Como Peak, Blackfoot to Sperry Glacier, Elrod Peak (Elrod).

Ranunculus affinis R. Br. Bigfork (Miss Norton).

Ranunculus affinis var. **validus** Gray. The form of this with smooth seeds called R. alpeophilus Nelson is common on MacDougal Peak, McDonald Peak.

Ranunculus sceleratus L. R. **eremogenes** Greene. Common at low elevations, Ravalli to Upper Marias Pass.

Ranunculus Pennsylvanicus L. Polson Swamp, Bigfork, Whitefish.

Ranunculus Macounii Britton. Common on lake shores, Ravalli, Ronan, Flathead Lake, Swan Lake.

Ranunculus tenellus Nutt. Common on lake shores and in wet meadows from Alta northward.

Ranunculus tenellus var. **Lyallii** (Gray) Rob. Bigfork.

Ranunculus circinatus Sibth. Common, Flathead Lake, Ravalli, Ronan.

Ranunculus aquatilis L. Common at low elevations; the var. capillaceus at Bigfork; var. trichophyllus. Common, var. caespitosus at Bigfork; var. heterophyllus at Alta and Upper Marias Pass.

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Ranunculus Cymbalaria Pursh. Darby, Browning, Upper Marias Pass, Missoula, Dayton, Hot Springs, St. Ignatius Mission.

Myosurus minimus L. Ronan.

Trautvetteria grandis Nutt. Alta.

Thalictrum sparsiflorum Turcz. Alta.

Thalictrum occidentale Gray. Common in open woods and mountain sides from Evaro northward. T. venulosum Trelease seems to be only a form of this.

Thalictrum purpurascens L. Ravalli, Ronan, Lolo. Gotten also at Plains by MacDougal.

Anemone parviflora Mx. MacDougal Peak, Lambert Valley, Blackfoot Glacier.

Anemone Drummondii Wat. Bt. Cal. 2 424 (1880). Drummond's Anemone. Elrod Peak (Elrod), and Mission Mts. (Elrod). Alpine. This little understood plant has alternately been referred to Tetonensis and allied species. A detailed description of it as it is may clear up some doubts. Flowers 35 mm. wide. Sepals fully 15 mm. long, oval, blue externally and white within, villous. Flowering peduncle 2.5-7.5 cm. long, 10 cm. long in fruit, stout, erect. Involucre with short and broad base, 7.5-15 cm. long, about like the leaves but large. Flowers single. Scape stout, almost none in flower, short in fruit. Plants caespitose from a thick root after the fashion of A. Hudsoniana. Leaves leathery, thrice ternate, with cuneate-oblanceolate lobes 9-13 mm. long and apiculate, nearly smooth. Styles filiform, 2.5 mm. long. Akenes long-woolly except in a narrow line on the back where it is short-hairy. Flowers about twice the size of A. Hudsoniana. Heads ovate 15 mm. long. Sperry Glacier, Lambert Valley, McDonald Lake, Mission Mts.

Anemone patens var. **Nuttalliana** (Spreng) Gray. Rexford, Garrison, Ravalli, Missoula (Elrod).

Anemone occidentalis Wat. Very common on MacDougal Peak and Blackfoot Glacier and Lambert Valley. Alpine.

Clematis hirsutissima Pursh C. Douglasii Hook. Evaro.

Clematis verticillaris var. **Columbiana** (Nutt.) Gray. Frequent from Alta to Blackfoot Glacier.

Coptis occidentalis (Nutt.) T. & G. Alta on rotten logs in deep shade.

Trollius laxus Salisb. Alta, McDonald Lake, Mission Mts., Sperry Glacier, abundant at Gunsight Pass and Lake.

Aquilegia flavescens Wat. Bot. King 10 (1871). Yellow Columbine. Common in open, wet and springy but well drained places and rarely on slopes, alpine and subalpine, even to the top of MacDougal Peak. Sometimes pink, but not differing otherwise. Piper, Fl. Wash, 279, states that this species freely intergrades with A. formosa. The writer has seen no such intergrades, but they are to be expected as this species, A. formosa, and A. truncata, ar manifestly recent offshoots of A. Canadensis, from which they hardly deserve separation. Robinson has also fallen into the error of Watson (Bot. King 10) in the Synoptical Flora, 43, where he speaks of the "alpine smaller flowered form" as regarded as distinct by me. Watson's smaller flowered form, as shown by his own specimens, was not alpine, but was got low down in City Creek Canon near Salt Lake City, and is a well defined species which I have many times collected in the type locality. Watson's reference to its being alpine is evidently an error which Robinson has copied. The plant described by Watson looks more like a hybrid between A. coerulea and the "small flowered form" in Utah, where Watson got it. It is always alpine. But identically the same thing grows throughout Wyoming, Idaho and Montana in places where A. coerulea is not found and therefore cannot be a hybrid. This species can be instantly separated from all forms of A. formosa that I have seen by the short and hooked spurs, but in the north country it is sometimes with red sepals. McDonald Peak, also Columbia Falls (Williams). MacDougal Peak (Elrod, MacDougal and Umbach). Hall's

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Peak (Miss Norton). Sperry Glacier (Umbach). McDonald Lake, Alta, Common. Lake McDonald to St. Mary's Lake, mostly alpine. Missoula.

Aquilegia formosa Fischer, is reported from all over the state but all forms so far seen are the above with tinged petals or sepals.

Aquilegia saximontana Rydberg. Gunsight Pass. This is nearer A. vulgaris, with glandular stems and pubescent fruit.

Aquilegia Jonesii Parry. Gunsight Pass.

Actaea spicata var. **rubra** Ait. Hort. Kew 2 221. A rubra (Ait) Willd. This includes the var, arguta which cannot be separated by any valuable character. A. eburnea Rydberg. Berries when red are indifferently spherical to oblong in the same spike which is oblong in fruit. Occasional in deep forests and along creeks in wet and springy places. Huckleberry spring, Schultze's cabin, the bog on the road to MacDougal Peak, Yellow Bay at creek, the Hemlocks, McDonald Peak, Hot Springs. Middle Temperate life zine. A form answering to var, arguta with white berries grows with the other but differs in no other way. These berries are almost always round, not so large, spikes elongating in fruit, leaves usually more cleft. MacDougal Peak, in the Mission Mountains, Common from Lake McDonald to St. Mary's Lake, Summit.

Aconitum Columbianum Nutt. Libby (Bailey).

Aconitum Columbianum var. **lutescens.** (Nelson Bot. Gaz., 41 54 1906, as species). Flowers constantly cream-colored. Alta, Lambert Valley. Not seen in the Sperry Glacier region.

Delphinium pauciflorum Nutt. MacDougal Peak, McDonald Lake Mission Mts., Blackfoot Glacier. Alpine.

Papaver nudicaule L. 507. Ours is the var. **arcticum** Elkan Mon. Pap. 16 (1839). Stanton Lake, Williams. Alpine. The published description of this species is not good. Stems from a densely leaved and few branched crown, and this from a slender and branching root. Leaves all radical, 5 cm. long, with blade 15-25 mm. long, broadly ovate, pinnately lobed with oblong-obovate apiculate and veiny lobes 2-5mm. long, thick, tips all with yellow needles and some on the face. Peduncles erect from a decumbent or curved base, 10 cm. long, slender, with stiff and yellow needles (not dark). Pods obovate-oval, more densely setose as well as the elliptical sepals, pods 15 mm. long.

Corydalis aurea Willd. Alta, McDonald Lake in the Mission Mts., Bigfork, (also by Elrod and Miss Norton).

Draba alpina L. Sperry Glacier.

Draba glacialis Adams. Sperry Glacier, Gunsight Pass.

Draba nemorosa L. Evaro, Missoula (Elrod).

Draba stenoloba Ledebour. MacDougal Peak, Sperry Glacier.

Draba crassifolia Graham. MacDougal Peak, Blackfoot and Sperry Glacier.

Lesquerella alpina Wat. Garrison. Probably also at Alta.

Lepidium apetalum Willd. Fort Missoula, Ravalli, Ronan, Alta. Missoula (Elrod).

Lepidium medium Greene. Common in fields.

Thlaspi alpestre L. Alta. Material gathered at Missoula by Elrod corresponds well with Watson's T. Californicum except that the radical leaves are wider and the pedicels indifferently spreading.

Thlaspi arvense L. Alta.

Capsella Bursa-pastoris (L) Medic. Common around dwellings.

Camelina sativa (L.) Crantz. Bigfork, Ronan.

Brassica arvensis (L.) BSP. A frequent weed in fields throughout the region.

Sisymbrium incisum Eng. var. **Hartwegianum** B. & W. Garrison.

Sisymbrium incisum var, **filipes** Gray. Evaro, Alta.

Sisymbrium canescens Nutt. Missoula (Elrod and MacDougal); Polson (Umbach).

Sisymbrium officinale (L.) Scop. St. Ignatius Mission.

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Sisymbrium altissimum L. A very common weed in fields throughout.

Erysimum cheiranthoides L. Ravalli, Evaro, McDonald Lake in the Mission Mts. Missoula (Elrod).

Erysimum asperum DG. Bigfork. Garrison.

Radicula Nasturtium (L.) Britten & Rendle. Common in springs throughout.

Radicula obtusa (Nutt.) Greene. Common at Bigfork, Ronan, Alta, Ravalli. This is hardly a good species.

Radicula curvisiliqua (Hook.) Greene. Bigfork.

Radicula palustris (L.) Moench. Bigfork, Dayton, Alta.

Barbarea vulgaris var. **stricta** (And) Gray. Missoula, Swan Lake, Evaro.

Dentaria macrocarpa Nutt. The leaves are remarkably thick and leathery. Stems spreading and much branched below. Roots white and elongated. It does not grow near water. Flowers very variable in size. McDonald Peak in talus, also crevices of rocks at Lambert Valley. Not seen in the Sperry Glacier region.

Cardamine Breweri Wat. I can see no difference between this and C. vallicola Nelson. Alta. Also at Missoula by Elrod, Columbia Falls by Williams, and Mission Mts. by MacDougal.

Cardamine oligosperma Nutt. Bull Island, Bigfork, Hot Springs, Alta.

Cardamine Pennsylvanica Muhl. Bigfork, Polson Swamp, Alta, Swan Lake (Elrod).

Cardamine parviflora L. Bigfork, Ravalli.

Arabis Nuttallii Rob. Lambert Valley, Mission Mts., Blackfoot Glacier.

Arabis glabra (L.) Bernh. Bigfork, Yellow Bay, MacDougal Peak, McDonald Lake in the Mission Mountains, Alta, Ravalli, Ronan, Lambert Valley, McDonald Lake.

Arabis Holboellii Hornem. Alta to the British Boundary.

Arabis Holboellii var. **patula** Wat. Upper Marias Pass. Swan Mountains (Elrod).

Arabis suffrutescens Greene. MacDougal Peak, Blackfoot Glacier.

Arabis Drummondii Gray. McDonald Lake in th Mission Mts., Sperry to Blackfoot Glacier.

Cleome serrulata Pursh. Bigfork, Hot Springs, Ravalli, Ronan. Missoula (Elrod).

Drosera rotundifolia L. Swan Lake. Rost Lake (Miss Norton).

ELROD'S STONECROP.

Sedum Elrodi n. sp. Closely related to S. divergens. Densely tufted from horizontal and fleshy rootstocks. Perennial. Leaves ovate, sessile, the lower 2-5 mm. long, the uppermost oblong-ovate, not over 5-12 mm. long, obtuse smooth. Stems erect from a sometimes decumbent base, closely covered with the nearly imbricated thick and closely appressed leaves, sparingly branched above, ending in 1-2 scorpioid racemes not over 2.5 cm. long and few flowered. Flowers yellow, nearly sessile. Petals lanceolate-acuminate, 7 mm. long, twice as long as the stamens and four times as long as the ovate and obtuse sepals. Follicles united below and divaricate above. At Somers on loose soil and also on rocks in open places. Middle Temperate life zone.

Sedum stenopetalum Pursh. MacDougal and McDonald Peaks, Sperry to Blackfoot Glacier. This is S. subalpinum Blenkinship, but his characters do not hold.

Sedum Douglasii var. **uniflora** (Howell Fl. 213 (1898) as species). Upper Marias Pass.

Sedum rhodanthum Gray. McDonald Peak, Sperry to Blackfoot Glacier, Lambert Valley, Upper Marias Pass. Mt. Lolo (Elrod).

Saxifraga oppositifolia L. Rare. Lambert Valley. Mission Mountains (Elrod).

Saxifraga adscendens L. MacDougal Peak.

Saxifraga chrysantha Gray. Mt. Lolo (Elrod).

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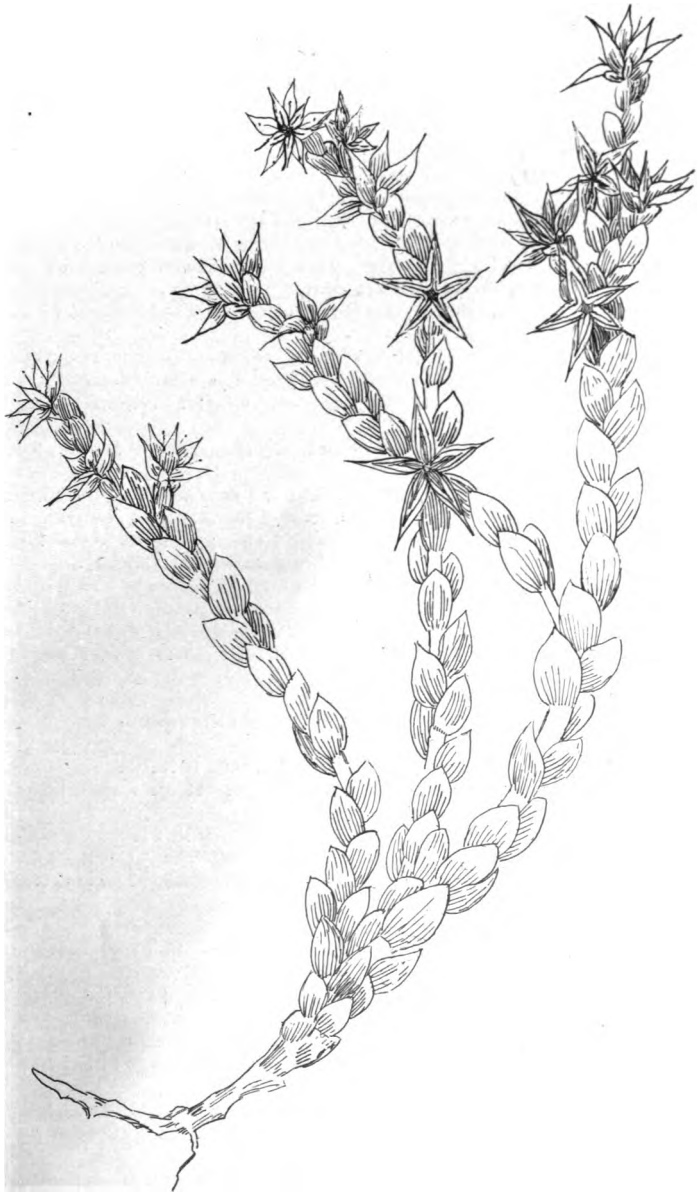
PLATE IV.



SEDUM ELRODI JONES, N. S.

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Saxifraga caespitosa L. Lambert Valley and Sperry Glacier.

Saxifraga rivularis L. Lambert Valley and Sperry Glacier, McDonald Lake in the Mission Mts.

Saxifraga debilis Eng. Reported from Sperry Glacier by Umbach, but may be the above.

Saxifraga cernua L. Lambert Valley.

Saxifraga Jamesii Torr. Mt. Lolo (Elrod). A very unexpected find. One would expect to find **S. heucheriforme** (Rydberg. Torr. Bull. 24 247 as Therofon) there instead.

Saxifraga arguta Don. MacDougal and McDonald Peaks, Yellow Bay, Alta. Common throughout the Mission and Swan Mountains at high elevations, and in the Sperry Glacier region. This is S. odontophylla Piper and S. punctata of recent authors. Piper is right in saying that the obovata-leaved S. punctata cannot be the same as this reniform leaved plant, but his name is preoccupied, and, in addition, S. arguta was well characterized by Hooker. It is easily separable from S. Nelsoniana by the clawed petals, as Piper has said, the latter being a Pacific Coast plant.

Saxifraga Mertensiana Bong. Darby at Como Peak, Sperry to Blackfoot Glacier.

Saxifraga stellaris L., S. Nutkana Moq., S. Bongardi Presl. There is a slight difference between this and S. stellaris, but that seems to be a very variable species. Common in the Sperry Glacier region. Leaves very variable.

Saxifraga reflexa Hook. McDonald Lake in the Mission Mountains, Sperry Glacier.

Saxifraga occidentalis Wat., Micranthes Alleni and aequidentata Small. Petals either entire or notched in the same flower, and either clavate or filiform also. MacDougal Peak, McDonald Lake in the Mission Mountains, Sperry to Blackfoot Glacier. Elrod Peak and Missoula (Elrod).

Saxifraga Oregana Howell., S. Sierrae Coville. This is the western representative of S. Pennsylvanica but with broader petals. The typical form has large and conspicuous petals, but they vary greatly down to S. Sierrae, and probably includes also S. Montanensis Small. It is a very robust plant. Mt. Haggin.

Saxifraga integrifolia Hook. This abounds in alpine places to the south of our region and adjoining it, but farther south passes by imperceptible degrees into

Saxifraga integrifolia var. **rhomboidea** (Green Pitt., 3. 343 as species). This is reported from Missoula and Deer Lodge. It grows at Lima. This again varies into

Saxifraga integrifolia var, **apetala** (Piper Torr. Bull. 27 393 as species).

Leptarrhena amplexifolia (Sternb.) Seringe. Sperry to Blackfoot Glacier. This grows in large patches from underground stems. Leaves waxy-green above and white below.

Boykinia major Gray. Hamilton.

Heuchera parvifolia var. **dissecta**. Leaves 5-7-lobed to or below the middle. Petals double the calyx lobes. Anaconda and Durant.

Heuchera cylindrica Dougl. Wheelock is certainly justified in putting all the variant forms into one species as there is a complete transition through all. This replaces S. rubescens on cliffs, which species abounds to the south in drier situations. The typical form with long red hairs on the petioles not yet found in our region.

Heuchera cylindrica var. **glabella** (T. & G.) Wheelock. Bull Island, Missoula, Bigfork, Coeur d'Alene Lake, Ravalli, Alta. Also gathered by all previous collectors.

Heuchera cylindrica var. **ovalifolia** (Nutt.) Wheelock. Lambert Valley Upper Marias Pass, Lake McDonald to St. Mary's in the Sperry Glacier region. Alpine.

Heuchera cylindrica var. **tenuifolia** Wheelock. MacDougal Peak.

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Heuchera Hallii var. **grossulariifolia** (Rydberg Fl. Mont. 196 as species) Ryan's Lake and Mt. Haggin, both bordering on Deer Lodge Valley. Also at Ketchum, Idaho (Mrs. Brodhead).

Heuchera Williamsii Eaton. This both Greene and Rydberg put into Tellima (Lithophragma) because it has a turbinate calyx and racemose habit, while they ignore the far more important heucheriod leaves, roots and five stamens, which clearly place it in Heuchera. Lima, probably not in our region.

Mitella trifida Graham. Bigfork, Alta, McDonald Lake in the Mission Mountains. Also Missoula by Elrod and MacDougal.

Mitella trifida var. **stauropetala** (Piper Erythea 7 161 as species.) Coeur d'Alene Lake, Deer Lake in Southern Idaho. Baker's number 263 from Mt. Hesperus, Colorado, is the same. This is a form with long and filiform lobes. Greene (Pitt. 1 32), Rydberg (Fl. Mont.), and Piper (Erythea 7), have split this species up into several unwarranted species, based on the development of lobes in the petals, but there is every gradation in length and width from rudimentary to long and filiform lobes. Greene's species is M. diversifolia, Rydberg's M. violacea, and Piper's M. stauropetala and stenopetala and var. Parryi.

Mitella Breweri Gray. Common on MacDougal Peak.

Mitella pentandra Hook. Common on all the high peaks from Alta northward.

Mitella nuda L. Frequent in dark woods from McDonald Lake in the Mission Mountains to the Boundary.

Tellima tenella (Nutt.) Walp. Missoula (Elrod); Columbia Falls (Williams).

Tellima glabra (Nutt.) Steud. Bigfork (Elrod); with short pedicels. Columbia Falls (Williams) with pedicels over half an inch long.

Tellima parviflora (Nutt.) Hook. Missoula (Elrod and MacDougal), Columbia Falls (Williams).

Tiarella trifoliata L. Bigfork, very rare. It was sought constantly throughout the region from Alta to Blackfoot Glacier this year but none could be found, while T. unifoliata was everywhere.

Parnassia parviflora DC. Swan Lake. All forms reported as P. palustris from this region are of this species. The Dissection of the staminodia amounts to but little.

Ribes Hudsonianum Rich., R. petiolare Douglas. There is no permanency in the characters of R. petiolare. Its leaves are normally much larger and longer petioled, but all sorts of intergrades occur, Alta, Hamilton, Anaconda and Mt. Haggin.

Ribes Howellii Greene. Its character of drooping short and few flowered racemes seems to hold, the others do not. St. Ignatius Mission in deep and dark willow swamps.

Ribes viscosissimum Pursh. Frequent in all the mountains from Alta northward.

Ribes cereum Dougl. Common in all the mountains from Alta northward.

Ribes lacustre (Pers.) Poir. Frequent at all elevations but most common at low elevations from Alta northward to the Boundary. The typical form has black fruit, slender racemes, and only lobed leaves.

Ribes lacustre var. **parvulum** Gray. This has leaves lobed nearly to the base and smooth, rarely over an inch wide, hardly deserves varietal rank. Hamilton, Anaconda, Alta.

Ribes lacustre var. **lentum** Jones, R. lacustre var. molle Gray. This is very pubescent and glutinous all over, with small and much dissected leaves often only half an inch wide. It is strikingly different from the type and grows in alpine places only and usually has red fruit, though not always. The type and var. parvulum have black fruit normally but often red when immature. Alta, Como Peak.

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Ribes oxyacanthoides L. The typical form does not seem to grow in the west.

Ribes oxyanthoides var. **saxosum** (Lindl.) Colville, R. inerme Rydberg, R. vallicola Greene. This is the common smooth gooseberry of the streams, growing under willows at low elevations. Missoula. The form corresponding to R. imerme, with long peduncle, grows at Lima and St. Ignatius Mission. The ripe fruit is very palatable. Belton, Below Gunsight Lake, Mission Creek, Monida.

Ribes setosum Lindl. Anaconda, Ravalli, Alta, McDonald Lake in the Mission Mountains.

Ribes irriguum Dougl. Fruit sometimes with a few scattered prickles and sometimes white. Probably this and R. setosum are not distinct. The plants that correspond to R. setosum are nearly smooth but with distinct cylindrical calyx, short peduncles, and sometimes is very setose, the species (R. setosum) is described as pubescent and very setose. What corresponds to R. irriguum has softly pubescent leaves and evident peduncles, and campanulate calyx. Bigfork, Yellow Bay, St. Ignatius Mission, MacDougal and McDonald Peaks, Bull Island, Dayton, Hot Springs, Missoula, Ravalli. Also Missoula (Elrod). I fail to see any good character to separate Green's R. cognatum or Blankinship's R. camporum.

Potentilla Monspeliensis L. Rexford and Whitfish, Ravalli, Upper Marias Pass. At the following places are the var. Norvegica, Bigfork, Daphnia Lake, Schultze's cabin.

Potentilla argentea L. Whitfish, apparently introduced.

Potentilla dissecta Pursh. MacDougal and McDonald Peaks, Lambert Valley, Sperry Glacier.

Potentilla dissecta var. **glaucophylla** (Lehm.) Wat. MacDougal Peak Same locality by Miss Norton and Umbach.

Potentilla decurrens (Wat.) Rydberg. Blackfoot Glacier.

Potentilla gracilis Dougl. Wild Horse Island.

Potentilla Blaschkeana Turcz. Alta, Ronan, Upper Marias Pass, Swan Lake by Elrod. A doubtful species.

Potentilla Nuttallii Lehm. Also a doubtful species. Alta, Monida. Missoula and St. Ignatius Mission (Elrod).

Potentilla ctenophora Rydberg. Monida, Missoula by Elrod.

Potentilla flabellifolia Hook. Ronan.

Potentilla Pennsylvanica L. Garrison and Lima.

Potentilla Hippiana Lehm. Browning.

Potentilla Anserina L. Frequent at low elevations throughout.

Potentilla pseudorupestris Rydberg. This probably includes convallaria. On all the high peaks from Alta northward. The convallaria form at Garrison.

Potentilla glutinosa Nutt. Alta to Bigfork on prairies and rocky Hillsides at low elevations. This may include P. Wrangeliana which was found at Alta.

Potentilla palustris (L.) Scop. Common in swamps at low elevations from Alta northward.

Geum ciliatum Pursh. Common in meadows at low elevations from Alta northward.

Geun rivale L. Bigfork, Below Gunsight Lake. Also Missoula (Elrod) and Rost Lake (MacDougal).

Geum strictum Soland. Ravalli.

Geum macrophyllum Willd. Common from Alta northward.

Purshia tridentata (Pursh) DC. Common on the western side of Flathead Lake, also on McDonald Peak.

Dryas Drummondii Rich. This seems to be rare. McDonald Peak and Blackfoot Glacier, alpine. The other species is very common.

Cercacarpus ledifolius Nutt. Alta. This has the habit of the var, intricatus but the leaves are nearer typical.

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Fragaria bracteata Heller. Alta, McDonald Lake in the Mission Mountains.

Fragaria platypetala Rydberg. Bigfork, McDonald Lake in the Mission Mountains. Lake McDonald to St. Mary's Lake. The species of strawberry are in a state of confusion.

Rubus pedatus Smith. Bigfork. Rost Lake by MacDougal and Miss Norton. Columbia Falls by Williams.

Rubus parviflorus Nutt., R. Nutkanus Moq. Very common from Alta northward.

Rubus Idaeus var. **acutissimus** Reg. & Lndl. R. strigosus Mx. This variety has very hispid pedicels, short-petioled leaves, coarsely serrate and wide, fruit nearly double the size of the prevailing western plant. Ravalli, McDonald Lake in the Mission Mountains.

Rubus Idaeus var. **gracilipes.** Leaves long-petioled; leaflets mostly narrowly ovate, not coarsely serrate; pedicels nearly smooth, sepals barely tailed; fruit rarely over half an inch long; flowers small. Very common from Alta northward, and throughout the west. R. nivalis reported by Watson from the Bitter Root Valley is almost certainly a depauperate form of this species and not the true R. nivalis.

Sanguisorba annua Nutt. Common on the Flathead plains, Ravalli, Ronan, Evaro.

Rosa Nutkana Presl. St. Ignatius Mission, Browning.

Rosa Nutkana var. **MacDougali** (Holzinger Bot. Gaz. 21 36 as species). Alta, Mission Creek, common throughout the Flathead region.

Rosa pisocarpa Gray. Common in open and dry woods from Alta northward.

Prunus Americana Marsh. This has become established at Ravalli and in the Bitter Root valley.

Prunus emarginata (Dougl.) Walp. Common throughout the region from Mission Creek northward but not seen in the Sperry Glacier region though found at Belton and Upper Marias Pass.

Prunus mollis (Dougl.) Walp. Sand Point, Idaho. Libby (Bailey). Reported from Ravalli by MacDougal and Butler but diligent search fails to reveal it there. This is considered to be a variety of P. emarginata but I have seen no intergrades.

Prunus demissa (Nutt.)Dietr. I fail to see any ground for Nelson's P. melanocarpa, even though Nuttall describes his as red fruited, for we know that this species has fruit red till dead ripe when it turns black. Common everywhere at low elevations.

Spiraea Douglasii Hook. Alta, Sand Point, Idaho. Silloway Peak, MacDougal, Elrod Peak (Elrod), Lolo (Watson).

Spiraea Douglasii var. **Menzissii** (Hook.) Presl. Libby (Bailey).

Spirea densiflora Nutt. Bigfork, MacDougal Peak, Sperry Glacier to Gunsight Lake.

Spiraea corymbosa Raf. Common from Alta northward.

Physocarpa opulifolia var. **pauciflora** (T. & G.) Piper. Very common throughout.

Crataegus Douglasii Lindl., Bot. Reg. 21 to 1810 (1836). C. rivularis Nutt. Douglas's Hawthorne. Fruit red till near maturity. This can always be separated from the other species by the small spines, never branched, and by the narrow and less lobed leaves, and the open and less scraggy habit. It is much infested with a fungus, Roestelia. Very common along creeks and on the lake shores. Fruit more juicy than the red one. The bark is all smooth and gray except on large trunks below, where it flakes up some. It is a slender and opened branched shrub 15-30° high. Fruit blue-black, oval. Common in all localities except on the mountains, also at Whitefish, Rexford and Sand Point, Idaho. Missoula (MacDougal), and Bigfork (Umbach), both as C. brevispina. Middle Temperate life. Belton, Ravalli, Ronan, McDonald Peak.

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Crataegus Columbiana Howell, Fl. 163 (1898). Columbian Hawthorne. This has gone under the name of C. occidentalis Britton and C. macracantha Lodd. as well as C. coccinea, and in all probability one name is as good as the other. There is no warrant whatever for the infinitessimal subdivision of Crataegus as is done by Sargent, Ashe, Britton, Rydberg and others. It can end only in making a species out of almost every sheet of specimens. Crataegus is remarkably sensitive to soil and drainage, like Amelanchier, and its leaves respond at once to varying conditions by their size and the amount of dissection of the margin as well as by the thickness. Another element of confusion lies in the fruit being red when immature in both species, turning black only at the last moment in C. Douglasii, and if specimens are taken by the grab sample way in which most are taken there is no reliance to be placed on the color. The only safe guide seems to be in the relation of the spines and leaves to each other. When the leaves are narrow and little dissected the spines are often slender. This is particularly true of the forms in the interior to which Greene has given the name salicifolia. The red fruited species in our region is common along creeks in the same situations as the other, and along the lake shore. When starved the leaves are small and the fruits few, but the bushes are very scraggly and thorny with generally branched thorns twice to four times as long as in the other species. Leaves normally much wider and more cut. The upper bark is smooth and gray, the lower bark rough in flakes. Fruit often as wide as long and sometimes yellow in trees growing side by side, and nearly always shorter and wider than in the other species. It is a pretty tree in the fall with its red fruit. Polson, Bigfork, St. Ignatius Mission, Wild Horse Island, Dayton, Hot Springs, where it is more abundant than the other. Wild Horse Island (Elrod), Rost Creek (MacDougal), Polson (Umbach, as C. occidentalis). Middle Temperate life zone. Some trees were completely covered by the red fungus Roestelia. No Crataegus in the Sperry Glacier region.

20. AMELANCHIER. SERVICE BERRY.

Amelanchier alnifolia Nutt. Gen. 1 306 (1818), and Jour. Phil. Acad. 7 22 (1834). This is the most sensitive to climatic differences of any species in the family. The humid regions have large and thin leaves with many teeth, long petals and racemose inflorescence, and fruit often half an inch wide. The most arid and hot regions have the leaves often not over half an inch long and nearly circular, and with few teeth, very thick and leathery, short petioles and raceme often reduced to a single pedicel, but in all this variance there is not a single permanent specific character. Our forms come near to those described as C. Cusickii Fernald with oval and subcordate leaves and long petals nearly an inch long. Fruit either one to few in a place or racemose, small or large, juicy or not. Common in dry places. Bigfork, Yellow Bay, on all the islands, Dayton, St. Ignatius Mission, McDonald Peak, Hot Springs. Elrod Peak (Elrod) and Wild Horse Island. Missoula (MacDougal and Elrod). Mission Creek, Lake McDonald to St, Mary's Lake, but not so common because of too much humidity, Ravalli, Ronan, Alta, McDonald Lake in the Mission Mountains.

Amelanchier alnifolia var. **Utahensis** (Koehne) Jones, is reported by both Piper and Rydberg from Washington and Montana but it does not grow in either state. Its habitat is on the edge of the Tropical life zone, under wholly different climatic conditions. The type of this variety is in my own herbarium collected by myself.

Pyrus Americana (Marsh) DC. Frequent from Alta northward.

Pyrus Sitchensis (Roem.) Piper. Blackfoot Glacier, Yellow Bay. There is doubt of the validity of this species.

Lupinus sericeus Pursh. Common in open pine woods from Alta northward.

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Lupinus ornatus Dougl. Bigfork, Daphnia Lake, Wild Horse Island, Ravalli, Ronan. The var. bracteatus collected at Missoula by MacDougal and at Wild Horse Island by Elrod.

Lupinus alpicola Hend. Common in subalpine burns. MacDougal Peak, also at Belton and Evaro. Doubtfully distinct from L. sericeus.

Lupinus laxiflorus Dougl. Alta, Monida. Also Missoula and Bigfork (Elrod). No lupines seen in the Sperry Glacier region.

Trifolium hybridum L. Alta.

Trifolium pratense L. Bigfork, Polson, Alta, Ronan.

Trifolium longipes Nutt., T. Rydbergii Greene, T. latifolium Greene, T. caurinum Piper, are forms. Evaro, Alta, McDonald Lake in the Mission Mountains. No clovers seen in the Sperry Glacier region.

Medicago Lupulina L. Ravalli.

Glycyrrhiza lepidota Nutt. Frequent along lake shores and streams from Alta northward.

Astragalus decumbens (Nutt.) Gray. This grades into a multitude of forms, according to the shade and soil in which it grows. A. decumbens var. campestris (Gray) Jones is an extreme form, with wide leaves and ascending habit. Other synonyms are A. convallarius Greene, Homalobus hylophilus Rydberg, etc. Wild Horse Island, Rexford, Alta. MacDougal Peak (Miss Norton).

Astragalus pectinatus (Hook.) Douglas. Browning.

Astragalus leptaleus Gray. Big Arm, Monida, Somers. Wild Horse Island (Elrod), MacDougal Peak (Miss Norton).

Astragalus miser (Dougl.) Gray. Garrison, Upper Marias Pass.

Astragalus Bourgovii Gray. Common on all the peaks from Lambert Valley to the Blackfoot Glacier.

Astragalus alpinus L. Alta, Echo Lake. Reported from several other localities but probably confounded with A. Bourgovii.

Astragalus elegans Hook., A. eucosmus Rob. Supposed to grow at Upper Marias Pass, but probably confounded with A. Bourgovii.

Astragalus aboriginum var. **glabriusculus** (Gray.) Jones. Upper Marias Pass.

Astragalus Americanus (Hook.) Jones. Alta.

Astragalus Drummondii Dougl. Garrison, Missoula (MacDougal).

Astragalus agrestis Dougl. Evaro, Ronan, Missoula (MacDougal).

Astragalus nitidus Dougl. Browning.

Astragalus Canadensis var. **Mortoni** (Nutt.) Wat. Occasional from Alta northward in open woods and fields.

Astragalus Purshii Dougl. Missoula (Elrod).

Astragalus inflexus Dougl. Wild Horse Island, Missoula. Also at Missoula by Elrod and MacDougal.

Astragalus crassicarpus Nutt., A. prunifer Rydberg. Garrison and Browning.

Astragalus arrectus Gray., A. Kelseyi Rydberg. Deer Lodge Valley.

Astragalus flexuosus Dougl. Browning.

Oxytropis deflexa DC. Blackfoot Glacier, Mt. Hagin, Browning.

Oxytropis alpicola (Rydberg Fl. Mont, 252 as Aragallus). Blackfoot Glacier, Mt. Haggin.

Oxytropis monticola Gray. Deer Lodge Valley, Echo Lake, MacDougal Peak (Elrod and MacDougal).

Oxytropis Lamberti var. **ochroleuca** Nelson. There is no character that separates this from O. Lamberti but the color of the flowers. There is no character that separates it from O. monticola but the appressed calyx hairs. Normally the flowers are an inch long and the pod a trifle stiffer than in O. monticola, and less inflated, but these characters vary greatly. No specimens of this variety have as yet been reported from our drainage but it is common eastward and southward. The low and single stemmed plant of the plains seems abundantly distinct but unfortunately it passes by imper-

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ceptible gradations into the tufted froms with purple flower and exactly like this variety except the color of the flowers.

Oxytropis gracilis (Nelson Erythea 7 60 as Aragallus). Upper Marias Pass.

Oxytropis nana Nutt. Garrison.

Oxytropis splendens Dougl. Upper Marias Pass, Browning.

Oxytropis viscida Nutt. in T. & G. Fl. 1 341 (1850), Aragallus viscidus (Nutt.) Greene, Aragallus viscidulus Rydberg. Viscid Oxytropis. Rydberg's attempt to elucidate this species in the Flora of Montana has only added to the confusion, while his additional species has no foundation. He refers Nuttall's type to Oregon when it must have been collected either in Montana or Idaho. Nuttall gives it as on the "Headwaters of the Oregon," but the "Oregon" does not head in Oregon. Rydberg gives it as growing at 4000 to 8000 feet on hills when it is seldom found lower than 9000 feet, and then on rocky ridges in subalpine places. Watson's locality was 10,000 feet elevation. In his A. viscidulus Rydberg gives the habitat as dry hills and mountain sides when it is always high alpine or subalpine, from timberline (11,500 feet altitude in Utah) to 10,000 feet altitude on rocky ridges. His characterization of both species is equally erroneous. He says O. viscida always has yellow hairs at base of stems, when they are nearly always white as in the other. He says the hairs on stem, calyx and pods are white and never black in O. viscida while they are both, or in some cases wholly absent. One can always find black hairs underneath the shaggy white ones in O. viscida, as the shaggy ones get less the black ones become more evident. In O. viscidula the pubescence varies likewise, but the black hairs ar more evident and the shaggy ones only occasionally in evidence. In my specimens from Mt. Haggin in Deer Lodge Valley near timber line there is no pubescence on the calyx at all except the always present stipitate yellow glands which are very abundant, the specimens are depauperate and the old pods broadly oblong and obliquely short-apiculate, and about 1 cm. long. In my material from Ryan's Lake, same valley, near timber line the calyx is shaggy with white and black hairs intermixed. In my material from Lima, doubtless the same locality where Rydberg got his, the calyx is loosely shaggy with black hairs as well as the pods, and in specimens got close by the calyx is shaggy with white hairs, with a few black ones underneath. The pods vary from oblong-ovate and short-acuminate to lanceolate-acuminate, and from long-beaked to apiculate in pods from the same tuft, and from a half inch long to an inch long, with divergent beak. It is evident that Nuttall's original was a depauperate plant with slightly developed pods. In all my material, of which I have much, my field notes say the flowers are bright red, in drying they turn to blue, or when not quickly dried turn white, and this is probably the reason why Nuttall's specimens seem white flowered. This should grow on all our high peaks. Rydberg refers Watson's material from the East Humboldt Mts. Nevada, to O. viscida and mine from the Wasatch to O. viscidula, while they are the same, as I have material from both localities. This plant also grows at Browning on gravelly knolls.

Hedysarum boreale Nutt., H. Americanum (Mx.) Britt., H. lancifolium Rydberg. Common on the high peaks from Como Peak to Upper Marias Pass.

Hedysarum sulphurescens Rydberg. Common on the high peaks from McDonald Peak north and east.

Linum Lewisii Pursh. Frequent on prairies and in open woods throughout.

Geranium incisum Nutt. Common from Alta northward.

Geranium Carolinianum L. Frequent in fields and waste places. Bigfork, St. Ignatius Mission, Whitefish, Ravalli.

Geranium Carolinianum var. **longipes** Wat., G. Bicknellii Britton. This grows with the type. Ravalli, Alta, Bigfork.

Erodium cicutarium L'Her. Missoula (MacDougal).

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Euphorbia glytosperma Eng. St. Ignatius Mission, Ravalli, Belton, Columbia Falls.

Euphorbia dictyosperma F. & M. Ravalli.

Callitriche palustris L. Bigfork, Ravalli, Alta, Darby, Browning.

Callitriche autumnalis L. Ronan, Evaro.

Rhus glabra L. Ravalli.

Rhus Toxicodendron L., R. Rydbergii Small. Frequent among rocks in all localities at low elevations.

Impatiens biflora Walt. Common in swamps at St. Ignatius Mission, Hot Springs, Ravalli, Sand Point (Idaho) and Bigfork, where it is in the latter place wholly cleistogamous.

Impatiens biflora var. **ecalcarata** Blankinship (Mont. Ag. Coll. Stud. 1 85 as species). This is simply a spurless form and grows along with the type. Also Swan Lake (Miss Norton).

Rhamnus Purshiana DC. Bigfork, Ravalli.

Ceanothus velutinus Dougl. MacDougal and McDonald Peaks, Upper Marias Pass.

Glossopetalon spinescens Gray. Alta.

Ampelopsis quinquefolia (L.) Mx., Parthenocissus—(L.) Planch, etc. Swan Lake, introduced.

Malvastrum coccineum (Pursh) Gray. Bitter Root and Deer Lodge Valleys, Browning.

Malva rotundifolia L. St. Ignatius Mission.

Sidalcea Oregana Gray. Ronan.

Hypericum Canadense var. **boreale** Britton. Polson Swamp, Bigfork.

Hypericum formosum HBK. Common from Ravalli to Blackfoot Glacier and St. Mary's Lake.

Hypericum Nortonae, n. sp. Miss Norton's St. John's Wort. Stems about 10 cm. long, erect from slender underground rootstocks, barely angled, simple. Leaves rather congested, nearly round to oval-ovate, obtuse, thick and scarcely at all black-punctate 1.5-2.2 cm. long, cordate, sessile, not clasping. Flowers 1-3, terminal, on a short, 2-bracted pedicels. Sepals ovate, obtuse, about 2.5 mm. long, greenish with purplish tips. Petals rather narrow strongly-many-nerved, yellow, 1-1.5 cm. long. Stamens many. Styles 3, long, distinct. Pods ovate, 3-lobed at tip. It is evidently allied to H. formosum. Alpine in moist places. McDonald Peak, Elrod Peak (Elrod). Dedicated to Miss Gertrude Norton, who has worked long on the flora of this region. Upper Marias Pass, Sperry Glacier, Lambert Valley. It shows no variation toward H. formosum.

Elatine Americana Arn. Common throughout the Flathead Valley.

Elatine brachysperma Gray. Alta.

Viola nephrophylla Greene. Bigfork, Swan Lake, Polson, Rost Lake, Wild Horse Island. Common.

Viola Canadensis L. Bigfork, Swan Lake, Rost Lake, McDonald Lake in the Mission Mountains, Blackfoot Glacier. Also gathered by all previous collectors.

Viola glabella Nutt. MacDougal Peak, Bigfork, Wild Horse Island.

Viola venosa (Wat.) Piper. Bigfork (Elrod).

Viola sarmentosa Dougl. McDonald Peak and Lake.

Viola sarmentosa var. orbiculata (Geyer) Gray. Bigfork, Yellow Bay, Belton.

Mentzelia laevicaulis (Dougl.) T. & G. Garrison.

Opuntia polyacantha Haw. Garrison, Browning.

Circaea alpina L. Common in damp and deep woods from the Mission Mountains northward.

Circaea alpina var. **Pacifica** (Asch. & Mag. Bot. Zeit. 29 392 as species). This has deeper toothed leaves and normally minute bracts on the racemes but there are all sorts of intergrades. Yellow Bay.

Gaura coccinea Pursh. Ravalli, Browning.

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PLATE V.

HYPERICUM NORTONAE JONES, N. S.

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Oenothera biennis L. Polson, Ravalli, Browning.

Gayophytum caesium (Nutt.) T. & G. Alta.

Gayophytum ramosissimum (Nutt.) T. & G. Alta, Garrison.

Gayophytum diffusum (Nutt.) T. & G. Hot Springs.

Gayophytum lasiospermum Greene. Darby.

Epilobium augustifolium L. Common from Alta northward.

Epilobium latifolium L. MacDougal Peak, Gunsight Pass, Blackfoot Glacier, Upper Marias Pass.

Epilobium minutum Lindl. Mission Creek.

Epilobium palustre L. Polson Swamp.

Epilobium adenocaulon Hausskn. Common from Alta northward at low elevations.

Epilobium alpinum L. MacDougal and McDonald Peaks, Upper Marias Pass.

Epilobium Hornemanni Reich. This is a very doubtful species as it seems to intergrade with E. alpinum. Common on all the high peaks from Alta northward.

Epilobium clavatum Trelease. A very doubtful species. MacDougal Peak (Elrod and Umbach).

Epilobium glandulosum Lehm. Swan Lake.

Hippuris vulgaris L. Common in swamps throughout.

Myriophyllum spicatum L. Dayton, Bigfork.

Myriophyllum hippuroides Nutt. Common at Bigfork.

Myriophyllum verticillatum L. Common on the shores of Flathead Lake, Swan Lake, Daphina and Rost Lakes, Dayton, Whitefish.

Cogswellia macrocarpa (Nutt.) Jones. Common on dry prairies from Missoula northward.

Cogswellia simplex (Nutt. Bot. King 129 as Peucedanum). Common from Alta northward.

Cogswellia Altensis, n. sp. Allied to C. simplex. Stems several from a fleshy, elongated, not tuberous root, dark-green, 7-15 cm. long, erect. Whole plant smooth. Leaves biternate, with short root petioles and vaginate stem ones. Leaflets nearly filiform, falcate, acute, 5-8 cm. long, entire. Peduncles slender, about 1.5 dm. long. Rays very unequal, from 1.5-5 cm. long, slender, 3-6. Involucels of few needle-like bracts. Pedicels 2.5-7.5 mn. long, slender. Fruit about 7 mm. wide and 12 mm. long, oblong-obovate, the wings as wide as the body. Oil tubes solitary and large. Ribs evident and raised. Oil tubes on commissure threadlike, one on each side of the midnerve, and with another running down half way outside of it. Seed nearly flat and with linear cross section. Wings thickest at inner edge where they are about half as thick as the body of the seed. Alta, under pines on the upper edge of the Middle Temperate life zone, on dry south slopes.

Cogswellia Sandbergii (C. & R.) Jones. Subalpine on MacDougal Peak, also at Lake Louise near Sperry Glacier. This cannot be located In Coulter and Rose's Monograph because it is placed under "glabrous throughout" in the key, while the fruit is puberulent.

Cogswellia ambigua (Nutt.) Jones. Mission Creek.

Cogswellia montana (C. & R.) Jones. Missoula (Elrod).

Angelica Roseana Hend. Mission Creek and McDonald Peak.

Leptotaenia multifida Nutt. Common in all the mountains to the alpine.

Peptotaenia multifida var. Eatoni (C. & R.) Jones. MacDougal Peak, Alta. This includes L. filicina Jones probably.

Heracleum lanatum Mx. Common from Alta northward.

Ligusticum tenuifolium C. & R. Alta.

Ligusticum Leibergi C. & R. Alta.

Cymopterus Elrodi n. sp. Habit of C. thapsoides. Shortly caulescent and densely branched from a woody root. Stems ascending, stout, 5-10 cm. long. Peduncles 3 dm. long. Leaves with stout petioles longer than the blades, blades ovate to deltoid in outline, ternately and then pinnately decompound,

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1 dm. long, with filiform and aculeate and rigid but smooth segments abou 2.5 mm. long. Rays about 10, unequal, 1.5-5 cm. long, stout. Slender pedi cels about 10 cm. long. Bractlets needle-like and short. Fruit about 9 mm long and half as wide, elliptical, truncate at tip and slightly emarginate a base. Lateral wings not over .6 mm. wide, dorsal reduced to raised ribs and with one or two of them slightly winged. Oil tubes about 5 in the interval and 14 on the commissure. Seed face concave. This is nearest to C. thap soides but the seed is twice as long and with mostly abortive wings. Alta Mont. In the canyon of the Bitter Root River among loose rocks and grave on dry knolls. July 11, 1909.

Musenium Hookeri Nutt. Garrison.

Bupleurum Americanum C. & R. Browning on the plains. Blankinship's B. purpureum is only an alpine form. Mt. Haggin and Lima.

Zizia cordata (Walt.) Koch. Browning.

Carum Gairdneri (H. & A.) Gray. Common from Alta northward.

Cicuta bulifera L.Swan Lake in swamp on decaying logs. Lake McDonald (Williams and Umbach).

Cicuta Douglasii (DC.) C. & R., C. vagans Greene. Browning, Ravalli.

Cicuta Douglassi var. **occidentalis** (Greene Pitt. 2 7 as species). This is the common form of the Great Plateau, with oval to elliptical fruit about 3 mm. long. Coulter and Rose say of this group "fruit oblong" while none of them are narrower than oval or elliptical, their own figure on p. 94 being oval or elliptical. In my specimens No. 1909 from Salt Lake City referred here by them the fruit is from depressed-orbicular to orbicular-ovate, and runs about 2 mm. long. They also say of the vagans group "fruit orbicular, oil tubes very narrow" while in fact they are very broad as often as narrow. St. Ignatius Mission.

Berula erecta (Huds.) Coville. Common all around Flathead Lake, Ronan, St. Ignatius Mission.

Sium cicutaefolium Gmel. Common in shallow water in all localities.

Osmorhiza divaricata Nutt. Coulter and Rose in their last monograph attempt to split up the species of this genus on the constriction of the tip of the fruit. An extensive examination of material shows that this is fallacious and their species invalid. This species includes Washingtonia Leibergi and brevipes. Leibergi forms are from MacDougal Peak and Blackfoot Glacier in the collection under consideration. Other forms are from the East Humboldt Mountains, Nevada, and Diamond Peak, Calif. My divaricata forms are from Ravalli and Bigfork, my brevipes forms from Bigfork and MacDougal Peak along with the others and growing under the same conditions.

Osmorhiza divaricata var. **nuda** (Torr. Pac. R. R. Rep. 4 93 as species). Washingtonia nuda and obtusa. Alta and MacDougal Peak. The Alta specimens have the leaflets of brevipes, but more acute, pedicels and peduncles very divaricate, fruit clavate, the body 10 mm. long, triangular-acute, beak .5-2.5 mm. long, stylopodium mostly wider than high and minute, pedicels longer than the fruit, leaflets 3-4 cm. long. Nelson's No. 4997 from Wallace Creek, Wyo., has the fruit peduncles and pedicels the same but fruit narrower and beak .5 mm. long and leaflets often 5.5 cm. long. My specimens from Payette Lake, Idaho, July 24, 1899, referred by Coulter and Rose to brevipes, are exactly obtusa in every particular, with the minute stylopodium and triangular-acute beakless tip, it also has the divaricate peduncles and pedicels. My No. 5580 from Provo, Utah, referred by them to this species is too immature to tell what it is, but some of the fruit is constructed below the tip like Leibergi, and with the minute depressed stylopodium. My No. 5893t from Marysvale, Utah, is not referred anywhere by them but is typical obtusa. O. nuda is readily recognized in California by the small leaves, broad leaflets and slender habit with elongated internodes and peduncles, but this form has both beaked and beakless fruit; when the beak is produced it is referred to brevipes by Coulter and Rose. The fruit is short and with

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short tails, pedicels longer than the fruit, plants mostly pubescent. This is represented in the interior more by the form obtusa, with smooth foliage somewhat larger and more pointed and narrower leaflets. All the species of Osmorhiza have the two forms of leaves, broad and deeply serrate or lobed leaflets, and lanceolate and less lobed and shallow serrate leaflets, which occur indifferently with the varying fruit characters. In the shade the leaflets are larger and more pubescent, in the sun they are much reduced, thicker and nearly smooth. Typical O. divaricata is characterized by the nearly linear beaked fruit with tail from nearly equal to half the body, pedicels nearly as long as the fruit (the central one often 1-2 inches long), large and acuminate leaflets, stylopodium longer than wide, plants nearly smooth.

Sanicula Marilandica L. Common from Evaro and Mission Creek to Sperry Glacier and Gunsight Lake.

Cornus Baileyi Evans. Is reported from our region, but the characters do not hold.

Pyrola minor L. Blackfoot Glacier.

Pyrola secunda L. Frequent from Alta northward.

Pyrola aphylla Smith. Yellow Bay and MacDougal Peak.

Pyrola chlorantha Swz. Yellow Bay and Bigfork.

Pyrola picta Smith. Como Peak.

Pyrola rotundifolia L. Common, Alta to Sperry Glacier.

Pyrola rotundifolia var. **bracteata** (Hook.) Gray. Belton, Gunsight Lake.

Pyrola rotundifolia var. **uliginosa** (Torr.) Gray. From MacDonald Lake in the Mission Mountains northward by Umbach, Miss Norton, MacDougal and Vreeland.

Pyrola rotundifolia var. **incarnata** DC. Mission Creek to St. Mary's Lake in the Sperry Glacier region.

Kalmia glauca var. **microphylla** Hook. MacDougal Peak. Common on all the peaks of the Sperry Glacier region.

Phyllodoce empetriformis (Smith) D. Don. Como Peak, common on all the peaks of the Sperry Glacier region, also Mission Creek. P. intermedia (Hook.) Rydberg.

Phyllodoce glanduliflorus (Hook.) Coville. Como Peak, Mission Creek. Common on all the peaks of the Sperry Glacier region. P. hybrida Rydberg.

Ledum glandulosum Nutt. Como Peak, Mission Creek, Alta, Belton.

Rhododendron albiflorum Hook. McDonald Peak and Mission Creek, Como Peak. This answers almost exactly to Cladothamnus.

Arctostaphylos Uva-ursi (L.) Spreng. Common everywhere on the mountains.

Vaccinium membranaceum Dougl., V. globulare Rydberg. Common at middle elevations from Alta northward.

Vaccinium caespitosum Mx. Upper Marias Pass.

Vaccinium myrtilloides var. **microphyllum** Hook. Common from Alta northward.

Vaccinium Canadense Kalm. Belton, Alta.

Centunculus minimus L. Ronan.

Douglasia montana Gray. Garrison. Missoula (Elrod).

Androsace septentrionalis L. Upper Marias Pass, Sperry to Blackfoot Glacier.

Androsace filiformis Retz. Alta.

Primula Parryi Gray. Como Peak.

Dodecatheon pauciflorum (Durand) Greene. Common from Alta northward.

Dodecatheon Meadia var. **lancifolium** Gray. Alta.

Dodecatheon Meadia var. **alpinum** Gray. Upper Marias Pass.

Frasera speciosa Dougl. Bitter Root Mountains.

Frasera albicaulis Griseb. Alta.

Gentiana Amarella L. Common from Alta northward.

Gentiana glauca Pall. Sperry Glacier. Also by Umbach.

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Gentiana affinis Griseb. Polson Swamp, Big Arm.
Apocynum androsaemifolium L. Darby to Upper Marias Pass.
Apocynum cannabinum L. Yellow Bay, Dayton, Polson, Ravalli.
Convolvulus arvensis L. Bigfork, Belton, St. Ignatius Mission.
Phlox Douglasii Hook. Como Peak, Lambert Valley. Missoula (Elrod).
Gilia debilis Wat. McDonold Peak (Elrod).
Gilia aggregata (Pursh) Spreng. Alta, Mission Creek. Missoula (Elrod).
Gilia linearis (Nutt.) Gray. Common from Alta to Lake McDonald.
Gilia gracilis (Dougl.) Hook. Ravalli, Jocko Creek, MacDougal.
Gilia minutiflora Bth. Alta.
Gilia pharnaceoides Bth. Alta to Upper Marias Pass.
Polemonium micranthum Bth. Hot Springs.
Polemonium coeruleum L. Alta.
Polemonium humile R. & S. Alta to Blackfoot Glacier.
Polemonium humile var. **pulchellum** (Bunge) Gray. MacDougal Peak and Mission Creek.
Polemonium confertum Gray. Gunsight Peak.
Phacelia Franklinii Gray. Alta, Evaro.
Phacelia heterophylla Pursh. Alta to Sperry Glacier region.
Nemophila breviflora Gray. Garrison.
Hydrophyllum capitatum Dougl. Bigfork, McDonald Lake in the Mission Mountains.
Lithospermum ruderale Dougl., L. lanceolatum Rydberg. Common, Alta to Upper Marias Pass.
Lithospermum arvense L. Bigfork.
Mertensia oblongifolia G. Don. Mission Creek, Upper Marias Pass. Columbia Falls (Williams), Missoula (MacDougal and Elrod).
Lappula Redowskii (Hornem.) Greene. Common Alta to Bigfork.
Lappula Redowskii var. **cupulata** (Gray Bot. Cal. 1 530 as Echinospermum Red. var.). This grows with the other and grades into it.
Lappula floribunda (Lehm.) Greene. Alta and northward.
Krynitzkia canescens Gray. Upper Marias Pass and Browning.
Krynitzkia Californica Gray. Alta, Evaro, Browning.
Krynitzkia Watsoni Gray. Darby.
Krynitzkia affinis Gray. Evaro, Alta.
Krynitzkia crassi Gray. Garrison.
Krynitzkia crassisepala Gray. Garrison.
Verbena bracteosa Mx. Ravalli to Browning.
Verbena stricta Vent. Hot Springs.
Monarda fistulosa L. Common. Evaro to Belton.
Lycopus uniflorus Mx. Rost Lake, Swan Lake, Schultze's cabin.
Lycopus Virginicus L. Bigfork and Swan Lake.
Lycopus Americanus Muhl. Bigfork, Jordan Lakes, Hot Springs.
Mentha arvensis var. **Canadensis** (L.) Briquet., M. rubella Rydberg. Bigfork, Missoula (Elrod).
Mentha arvensis var. **glabrata** (Bth.) Fernald. Common all around Flathead Lake, Swan Lake, Hot Springs, St. Ignatius Mission.
Stachys palustris L. Common, Evaro and Ravalli to Whitfish and Rexford.
Physostegia parviflora Gray. Common all around Flathead Lake, Missoula (Elrod).
Prunella vulgaris L. Alta and northward.
Agastache urticifolia (Bth.) Rydberg. Evaro. Missoula (Elrod).
Nepeta Cataria L. Bigfork, Mission Creek.
Dracocephalum parviflorum Nutt. Ravalli, Evaro, Alta. Jocko Creek (MacDougal).
Scutellaria galericulata L. Common in swamps at Bigfork, Hot Springs, Swan Lake, Evaro, and around Flathead Lake.
Solanum triflorum Nutt. Evaro.

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Physalis pubescens L. Bigfork.

Pedicularis bracteosa var. **Montanensis** (Rydberg Torr. Bull. 24 293 as species). This does not differ in anything but the purple flowers. The low altitude forms have spikes a foot long. Lambert Valley, Mission Creek, McDonald Lake, Bigfork, MacDougal Peak and Lake McDonald to St. Mary's.

Pedicularus Canbyi Gray, was again found on McDonald Peak. Also got on Silloway Peak by MacDougal.

Pedicularis Groenlandica Retz., Elephantella Rydberg. Frequent in the high mountains from Alta northward. All the other species of Pedicularis reported from this region were found.

Orthocarpus luteus Nutt. Upper Marias Pass, Bull and Wild Horse Islands.

Castilleia miniata Dougl. It is very variable in the pubescence and length of galea, very common from Alta northward.

Castilleia angustifolia (Nutt.) G. Don. Bigfork.

Castilleia pallida HBK. This is a very doubtful species. Common from Evaro and Ravalli northward.

Castilleia pallida var. **lutescens** Greenman. Wild Horse Island, Bigfork, Upper Marias Pass, MacDougal Peak (Miss Norton).

Castilleia parviflora. This has been reported from various parts of our region, but all seem to be forms of angustifolia or miniata. I can make nothing out of the species proposed by Rydberg.

Castilleia pallescens (Gray) Greenman. Ravalli, Ronan, Evaro, Missoula (MacDougal).

Veronica Americana Schw. Common from Alta northward.

Veronica alpina L., V. Wormskioldii R. & S. Mission Creek to Blackfoot Glacier.

Veronica serpyllifolia L. Alta to Blackfoot Glacier.

Veronica serphyllifolia L. Alta to Blackfoot Glacier.

Synthyris rubra (Hook.) Bth. Mission Creek, Evaro, Ravalli, Ronan, Missoula (Elrod).

Gratiola Virginiana L. Bigfork, Wild Horse and Bull Islands, Polson (also by Miss Norton). Rost Lake (MacDougal).

Mimulus caespitosus Greene. Lambert Valley, Sperry to Blackfoot Glacier.

Mimulus Breweri (Greene) Rydberg. Alta.

Mimulus Langsdorfii Donn. Common Alta to Bigfork and MacDougal Peak.

Mimulus moschatus Dougl. Alta, Mission Creek, Evaro, Trail Creek (MacDougal).

Scrophularia nodosa var. **Marylandica** (L.) Gray. Ravalli, St. Ignatius Mission.

Pentstemon acuminatus Dougl. Alta, Deer Lodge Valley.

Pentstemon eriantherus Pursh., P. cristatus Nutt. Deer Lodge Valley, Missoula (Elrod).

Pentstemon attenuatus Dougl. Prairies on Wild Horse Island, Ravalli, Garrison, Ronan, Evaro.

Pentstemon procerus Dougl. Missoula, McDonald Lake in the Mission Mountains, Upper Marias Pass.

Pentstemon procerus var. **micrantus** (Nutt. Jour. Phil. Acad. 7 45 as species). Alta, Missoula (Elrod), Columbia Falls (Williams).

Pentstemon ovatus Dougl. Wild Horse Island, MacDougal Peak. Mission Mountains (MacDougal) as P. pinetorum.

Pentstemon Richardsonii Dougl. Alta, Como Peak, Missoula, Evaro.

Pentstemon Menziesii Hook. This is a very variable species and has received many names, but the forms all intergrade. Common on all the peaks from Como Peak northward.

Verbascum Thapsus L. Bigfork, Ravalli, Columbia Falls.

Verbascum Blattaria L. St. Ignitaus plains.

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Utricularia vulgaris L. Bigfork. Also found previously by Elrod and Miss Norton.

Orobanche fasciculata Nutt. Bigfork, Wild Horse Island, Browning, Wild Horse Island (Elrod).

Orobanche comosa Hook. Hot Springs.

Plantago major L. Swan Lake, and all the settlements around Flathead Lake.

Plantago Tweedyi Gray. Deer Lodge Valley, Browning.

Plantago Purshii R. & S. Common on the low lands throughout.

Plantago Purshii var. **aristata** (Mx. Fl. 1 95 as species). Ravalli.

Galium Aparine L. Missoula, Ravalli.

Galium Aparine var. **Vaillantii** (DC.) Koch. Reported from McDonald Lake in the Mission Mountains by MacDougal.

Galium trifidum Mx. Common from Alta northward.

Galium asperrimum Gray. Alta, Darby.

Galium triflorum Mx. Common from Alta northward.

Galium boreale L. Common from Alta northward.

Sambucus pubens L. MacDougal Peak, Alta.

Sambucus melanocarpa Gray. Common from Alta northward.

Sambucus glauca Nutt. Bigfork and Yellow Bay.

Sambucus decipiens n. sp. This is what has passed for S. Canadensis throughout the Rocky Mountain region and has been called S. glauca by many because of the remarkably glaucous fruit. It differs from that species in the regular elderberry habit, namely, tufted and short-lived stems and very large leaves, and differs conspicuously from S. Canadensis in always having white-glaucous fruit. Berries 5-6 mm .wide. Joints of stems very prominent. Leaflets oblong-lanceolate, acuminate, smooth. Corymbs with 5-7 stout branches, the whole often 4.5 dm. wide and very heavy. Fruit almost black, pleasant. It grows in open clumps normally about 3.5 m. high, but is stouter than the eastern S. Canadensis, has larger leaves, and larger corymbs and fruit which is always glaucous. The type is from my specimens from St. Ignatius Mission, others are from the Hot Springs. Other all my material distributed from the West except my Californian material as S. glauca. Middle Temperate life zone. Ravalli, Alta, Mission Creek, Ravalli. Not S. Neo-Mexicana Wooton which is apparently S. Mexicana.

Linnaea borealis L. Everywhere in the woods.

Symphoricarpos racemosus Mx. Common in all localities.

Symphoricarpos rotundifolius Gray. S. vaccinioides Rydberg. Alta, Ronan, Ravalli, Evaro.

Lonicera Utahensis Wat. Frequent from Alta northward.

Lonicera involucrata Banks. Common from Alta northward.

Valeriana sylvatica Banks., V. septentrionalis Rydberg, V. occidentalis Heller. From Alta northward. Common.

Valeriana Sitchensis Bong. This is well marked in the extreme forms but seems to vary into the above. From Mission Creek to Blackfoot Glacier.

Echinocystis lobata (Mx.) T. & G. Bigfork and Ravalli. Cult.

Specularia perfoliata (L.) A. DC. Ravalli, Ronan, McDonald Lake, MacDougal.

Campanula rotundifolia L. Everywhere.

Heterocodon rariflorum Nutt. Ronan.

Lobelia Kalmii L. Rost Lake, Polson Swamp. Also by previous collectors.

Tragopogon porrifolius L. Bigfork.

Microseris nutans (Geyer) Sch. Mission Creek, Columbia Falls (Williams).

Hieracium gracile Hook. McDonald and MacDougal Peaks and through the Sperry Glacier region.

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Hieracium cynoglossoides Arvet-Touv. Wild Horse Island, Ravalli, Evaro. This is a very doubtful species.

Hieracium Scouleri Hook. H. griseum Rydberg. Rydberg in making his untenable species goes directly in the face of the statement of Gray in the Synoptical Flora page 427 that Scouler distributed specimens of H. cynoglossoides as H. Scouleri, and in the face of Hooker's original description. Common from Alta northward.

Crepis glauca (Nutt.) T. & G. Deer Lodge Valley.

Crepis runcinata (James) T. & G. Bigfork, Ronan.

Crepis acuminata Nutt. Frequent from Alta northward.

Crepis intermedia Gray. A very poor species. Alta to Bigfork.

Crepis occidentalis Nutt. Garrison.

Prenanthes hastata var. **sagittata** (Gray Syn. Fl. 1 2 435 as alata var.). Frequent from Alta northward to Blackfoot Glacier.

Agoseris aurantiaca (Hook.) Greene. From Alta northward.

Agoseris gracilens (Gray) Greene. Published by Greene as gracilenta. Alta, MacDougal and McDonald Peaks. Hardly more than a variety of the above.

Agoseris grandiflora (Nutt.) Greene. Alta to Bigfork.

Taraxacum officinale Weber. Common as a noxious weed from Alta northward. The indigenous alpine variety rare in the Sperry Glacier region.

Lactuca Ludoviciana (Nutt.) DC. Bigfork and Mission Creek .

Lactuca pulchella (Pursh) DC. Common around Flathead Lake, always appearing as if an introduced plant.

Lactuca spicata (Lam.) Hitchk. Bigfork, Mission Creek, St. Ignatius Mission, Polson, Hot Springs.

Sonchus asper (L.) Hill. Bigfork, Hot Springs, Mission Creek.

Sonchus oleraceus L. Dayton.

Cirsium arvense (L.) Scop. Evaro, Deer Lodge Valley.

Cirsium Hookeriana Nutt. Alta and northward.

Cirsium Drummondii T. & G. Blackfoot Glacier.

Cirsium Hallii (Gray Proc. Am. Acad. 19 56 as Cnicus). Dayton, Hot Springs, Yellow Bay, St. Ignatius Mission.

Cirsium undulatum (Nutt.) Spreng. Ravalli to Bigfork, rather common.

Gnaphalium decurrens Ives. Darby, Columbia Falls (Williams), Swan Lake (Umbach).

Gnaphalium palustre Nutt. Frequent from Alta to Browning.

Antennaria luzuloides T. & G. Bigfork (Elrod), Columbia Falls (Williams).

Antennaria pulcherrima (Hook.) Greene. Ravalli.

Antennaria anaphaloides Rydberg. Evaro, McDonald Lake in the Mission Mountains, Upper Marias Pass.

Antennaria racemosa Hook. Alta to Blackfoot Glacier.

Antennaria Howellii Greene. Evaro.

Antennaria parvifolia Nutt. Garrison.

Antennaria rosea (Eaton) Greene. A very doubtful species. Bigfork, Alta, Evaro.

Antennaria Hendersoni Piper. Bigfork, Alta, Evaro, McDonald Peak.

Antennaria microphylla Rydberg. Somers, Missoula and Bigfork (MacDougal).

Antennaria media Greene. MacDougal Peak, Sperry to Blackfoot Glacier.

Antennaria umbrinella Rydberg. There is a striking difference in the bracts between this and the above but they do not seem to be distinct, in addition the clavellate pappus does not seem to hold. Darby to Blackfoot Glacier.

Antennaria flavescens Rydberg. Missoula (Elrod). This material named by Rydberg differs materially from his description and is not at all flavescent and seems to be A. parvifolia. Alta, Evaro.

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Adenocaulon bicolor Hook. Everywhere in the mountains to Gunsight Lake from Ravalli northward.

Artemisia dracunculoides Pursh. Kalispell, Dayton, Wild Horse Island. Elrod Peak (Elrod).

Artemisia frigida Willd. Hot Springs to Browning.

Artemisia biennis Willd. Whitefish, Browning.

Artemisia Ludoviciana Nutt. Common from Alta northward.

Artemisia Ludoviciana var. **atomifera** (Piper Fl. Wash. 588 as species). McDonald Peak.

Artemisia discolor Dougl. Blackfoot Glacier, Upper Marias Pass.

Artemisia discolor var. **incompta** (Nutt.) Gray. Gunsight Pass.

Artemisia tridentata Nutt. Alta, Little Bitter Root.

Artemisia rigida (Nutt.) Gray. Wild Horse Island, also by Elrod.

Artemisia absinthium L. Bigfork.

Matricaria discoidea DC. Common Alta and northward.

Chrysanthemum leucanthemum L. Ravalli as a bad weed.

Achillea Millefolium L. Alta and northward. The var. rosea also occurs.

Anthemis arvensis L. St. Ignatius Mission.

Senecio vulgaris L. Bigfork, Columbia Falls, Belton.

Senecio negacephalus Nutt. From McDonald Peak to Gunsight Pass.

Senecio integerrimus Nutt. Deer Lodge Valley, Missoula, Upper Marias Pass. Also MacDougal Peak MacDougal.

Senecio hydrophilus Nutt., S. hydrophiloides Rydberg. Evaro.

Senecio triangularis Hook., S. saliens Rydberg. Alta to Blackfoot Glacier. S. variifolius Rydberg is a more robust form.

Senecio hydrophilus Nutt., S. hydrophiloides Rydberg. Evaro.

Senecio lugens Rich. Alta.

Senecio Fremonti T. & G. MacDougal Peak to Blackfoot Glacier.

Senecio canus Hook. Missoula to Gunsight Pass.

Senecio subnudus DC. Mission Creek, Sperry to Blackfoot Glacier.

Senecio ovinus Greene. Sperry Glacier. Probably only a form of the above.

Senecio Balsamitae Muhl. Monida.

Senecio cymbalarioides Nutt. Lima and Monida, Stanton Lake (Williams), MacDougal and Silloway Peak (MacDougal).

Arnica Parryi Gray. MacDougal and McDonald Peaks.

Arnica longifolia Eaton. Alta to Blackfoot Glacier.

Arnica amplexicaulis Nutt. Whitefish. Mrs. Kennedy's specimen quoted by Rydberg as this species is A. foliosa.

Arnica foliosa Nutt. Bigfork and Swan Lake, Lambert Valley.

Arnica pedunculata Rydberg., A. monocephala Rydberg. Evaro.

Arnica betonicaefolia Greene. McDonald Peak, Lambert Valley, Blackfoot Glacier.

Arnica betanicaefolia var. **gracilis** (Rydberg Torr. Bull. 24 297 as species). A. multiflora Greene. McDonald Peak and Lake. Throughout the Sperry Glacier region.

Brichellia grandiflora Nutt. McDonald Peak and Lake, Lincoln Pass at Sperry Glacier.

Liatris punctata Hook. Browning.

Gutierrezia Sarothrae (Pursh) Britton. Deer Lodge Valley.

Grindelia nana Nutt. Ravalli, Flathead plains to Hot Springs.

Chrysopsis villosa (Pursh) Nutt. Ravalli and Garrison to Bigfork.

Bigelowia viscidiflora (Hook.) DC. Wild Horse Island, Polson.

Bigelowia nauseosa (Pall.) Jones. Alta to Browning, not common.

Solidago humilis Pursh. Browning. Elrod Peak (Elrod), Silloway Peak, (MacDougal).

Solidago confertiflora. Somers.

Solidago Tolmieana Gray. Elrod Peak (Elrod), Bigfork(MacDougal).

Solidago Guiradonis Gray. Bull Island.

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Solidago Missouriensis Nutt. Alta to Browning.

Solidago serotina Ait. Swan Lake (also Miss Norton and Umbach), Ravalli.

Solidago elongata Nutt. Bigfork, Rost Lake (MacDougal).

Solidago Canadensis L., S. caurina Piper. Alta to Browning.

Solidago Canadensis var. **salebrosa** (Piper Fl. Palouse 185 as species). This is a marked form intergrading with the type and differs in the heads being twice the size of those of the species. Without the intergrades it would be placed with S. serotina. Wild Horse Island, Mission Creek.

Solidago nemoralis Ait. Deer Lodge Valley.

Solidago occidentalis (Nutt.) T. & G. Bull Island, Echo Lake, Ravalli, Missoula (Elrod).

Hoorebekia acaulis (Nutt. Jour. Phil. Acad. 7, 33 as Chrysopsis). Ours is the var, caespitosa (Nutt. same cit. as Chrysopsis). Bigfork (Miss Norton.

Hoorebekia lanceolata (Hook. Fl. Bor. Am. 2 25 as Donia). Not yet reported.

Hoorebekia uniflora (Hook. l. c. as Donia). Browning.

Hoorebekia integrifolia (Porter Proc. Am. Acad. 16 79 as Aplopappus). Deer Lodge Valley, Upper Marias Pass.

Aster scopulorum Gray. Deer Lodge Valley.

Aster stenomeres Gray. Deer Lodge Valley and Big Hole country.

Aster Hallii Gray. Dayton.

Aster Fremonti (T. & G.) Gray. Swan Lake, St. Ignatius Mission.

Aster occidentalis Nutt. Bigfork and around Flathead Lake.

Aster foliaceus Lindl. Alta to Blackfoot Glacier.

Aster foliaceus var. Eatoni Gray. Bigfork, Wild Horse Island.

Aster Cusickii Gray. McDonald Peak.

Aster laevis L. Alta to Belton. The var. Geyeri at Alta.

Aster oblongifolius var. **rigidus** Gray. Upper Marias Pass.

Aster modestus Lindl. St. Ignatius Mission, Alta.

Aster radulinus Gray. Elrod Peak (Elrod).

Aster Sibiricus L. Blackfoot Glacier, Upper Marias Pass. Elrod Peak (Elrod).

Aster canescens Pursh. Deer Lodge Valley.

Erigeron armeriaefolius Turcz. Ledebour describes the two forms that Rydberg tries to separate. Alta.

Erigeron acris L. Bigfork.

Erigeron acris var. **draebachensis** (Mueller) Blytt. Lambert Valley and McDonald Lake.

Erigeron acris var. **debilis** Gray. Alta.

Erigeron alpinus L. Blackfoot Glacier. This is a well marked species.

Erigeron ramosus (Walt.) BSP. Bigfork, Ravalli, Garrison.

Erigeron divergens T. & G. Bigfork, Wild Horse Island, Ronan, Ravalli, Missoula.

Erigeron corymbosus Nutt. Bigfork, Wild Horse Island, Lima.

Erigeron glabellus Nutt. This is E. oblanceolatus Rydberg which may be distinct. Ravalli, Alta, Lambert Valley.

Erigeron speciosus DC. Alta and northward. Common.

Erigeron macranthus Nutt. Mission Creek, Blackfoot to Sperry Glacier. These two species are too close together.

Erigeron uniflorus L. Gunsight Pass, Elrod Peak (Elrod).

Erigeron grandiflorus Hook. Sperry to Blackfoot Glacier.

Erigeron concinnus (H. & A.) T. & G. Ravalli, Missoula, Wild Horse Island. Also by former collectors.

Erigeron filifolius Nutt. Columbia Falls (Williams), Polson (Umbach).

Townsendia Parryi Gray. Garrison.

Iva axillaris Pursh. Ronan to Browning.

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Iva xanthiifolia Nutt. Belton, Hot Springs, St. Ignatius Mission. It acts like an introduced plant.

Xanthium Canadense Mill. Hot Springs, St. Ignatius Mission, Browning.

Rudbeckia occidentalis Nutt. Ravalli, Evaro.

Lepachys columnaris Sims. Ft. Missoula. Evidently introduced but well established.

Balsamorhiza Hookeri Nutt. Deer Lodge Valley.

Helianthus annuus L. Common.

Helianthus rigidus Desf. Dayton, Columbia Falls, Belton.

Helianthus Nuttallii T. & G. Dayton, Ravalli, Kalispell, Hot Springs.

Helianthus Californicus var. **Utahensis** Eaton. St. Ignatius Mission.

Coreopsis Atkinsoniana Lindl. Sand Point, Idaho, Whitefish.

Bidens cernua L. Ronan, Whitefish, Swan Lake, St. Ignatius Mission.

Madia exigua (Smith) Greene. Bigfork.

Madia glomerata Hook. Bigfork, St. Ignatius Mission, Hot Springs, Columbia Falls, Darby, Upper Marias Pass, Browning.

MOSSES.

Considerable attention has been given the moss flora, though the knowledge of the flora is not by any means complete.

In 1898 Professor John M. Holzinger devoted a season to the mosses of the Sperry Glacier region. In 1901 W. P. Harris devoted a season to the mosses of the vicinity of Flathead Lake. This material was identified by Carolyn M. Harris. In 1908 I also collected the more common mosses of the Lake and adjacent mountains, though no attempt was made to make it thorough, as my time was devoted to the higher plants chiefly.

All my material was identified by Mr. Holzinger, and the Harris material was examined by Mrs. Britton.

Fortunately Mr. Holzinger had prepared a manuscript of his Sperry Glacier mosses which I have prevailed on him to permit me to print in this report. It is so much more complete than the Harris or my list that it is given as prepared. I have added to it the localities and few additional species found on the Harris list and my own, always adding the name of Harris or Jones to all species collected by us, so that all other localities and notes may be known as those of Mr. Holzinger.

"In July, 1898, the writer, J. M. Holzinger, in company with Mr. James Blake, made a vacation trip into Northwest Montana, during which they collected the Mosses and Hepatics herewith published. The region visited is reached by the Great Northern railway, which we left at Belton, thirty miles east of Kalispell, striking some twenty miles north, to the north end of Lake McDonald. There we pitched our permanent camp. The country is very rugged and secluded. It is especially interesting because of the several glaciers which nestle among the precipitous mountain peaks. We visited only one of these, Sperry Glacier.

During our brief stay we made the following excursions: To Holzinger's Basin, eight miles east of camp, July 16 to 19; to McCrimmin Falls, on the McDonald Creek, near the upper end of the lake, July 20; to Mt. Trilby, four miles northwest of camp, July 21; to Sperry Glacier, twelve miles northeast of camp by way of Holzinger's Basin and the Rim, July 24 to 26; and to Avalanche Basin, below Sperry Glacier, 10 miles northeast of camp. A more detailed account of this interesting region may be found in the September number, 1900, of the Bulletin of the American Bureau of Geography.

The determination of the collection has been delayed for various reasons. Dr. R. H. True has determined most of the Dicrana; Dr. H. J. Grout, the Eurhynchia and Brachythecia, and several other species; Dr. G. N. Best, the Prendoleskear, etc.; Dr. C. Warnstork the Sphagna; Mr. Renauld, the Harpidia; Mrs. Britton has determined the Orthotrica, and has critically exam-

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ined a considerable number of species submitted, especially Grimmias and Mniums. Messrs. Cardot and Theriot have generously examined and determined a promiscuous lot of things. Dr. A. W. Evans has determined all the Hepaticae. To all these persons I herewith express my gratitude for their generous and ever cordial assistance. Since I have been able to do comparatively little toward determining this collection, the credit for the work is due the more largely to my biological friends.

"The numbers in this report refer to a set of mosses from this collection which were distributed in 1899."

From manuscript by Professor J. M. Holzinger.

In the Botanical Gazette of Aug., 1900, were published 13 species and varieties of mosses from this collection, being either new or new to North America. They are again inserted in the general list herewith submitted.

Sphagnum acutifolium var. **viride** W., form pusillum. W. Base of Sperry Glacier.

Sphagnum acutifolium var. **versicolor** form pusillum W. Base of Sperry Glacier.

Sphagnum molle Sull. Base of Sperry Glacier.

Sphagnum molle, form **squarrosulum** Gravet. Base of Sperry Glacier.

Sphagnum robustum Roell. Forms **Fibrosum** and **pallido-flavescens** Roell. (Identified by Dr. Julius Roell). "Interesting by reason of the numerous fibers, and the single pores in the branch leaves, by its pale cortex and low stature, all high altitude characters." This grew in the cold water at the camping place below the rim, Sperry Glacier, alpine.

Andreaea petrophila Ehrh. Banks of McDonald Creek near McCrimmin Falls, Sperry Glacier region.

Andreaea alpestris Sch. Mt. Trilby and Mt. Stanton.

Dicranoweisia cirrhata Lindb. Mt. Trilby and Mt. Stanton.

Dicranoweisia contermina Ren. & Card. Holzinger Basin, Mt. Trilby.

Dicranoweisia subcompacta Card. & Ther. in Bot. Gaz. 29 122 (1900). Along the trail from Holzinger Basin to the Rim, which is the highest ledge of rock in the ascent from Holzinger Basin to Sperry Glacier.

Dicranoweisia cirrhata Lindb. Sperry Glacier and Darby (Jones).

Cynodontium polycarpum B. S. Holzinger Basin.

Cynodontium polycarpum var. **strumiferum** B. S. McCrimmin Falls, head of Lake McDonald, Sperry Glacier region. Also by Jones at Swan Lake.

Cynodontium virens B. S. Sperry Glacier (Jones).

Dicranum undulatum Ehrh. Belton (Jones).

Dichodontium pellucidum Sch. a form. Holzinger Basin.

Dicranum Bonjeani De Not. Avalanche Basin. Also by Harris at McDonald Lake in the Mission Mountains, and by Jones at foot of MacDougal Peak, Bigfork and Yellow Bay. Alta and McDonald Lake in the Mission Mountains.

Dicranum fragilifolium Lindb. Holzinger Basin, Mt. Trilby. Also by Harris at Mud Creek and McDonald Lake in the Mission Mountains, and by Jones at Bigfork and Somers.

Dicranum falcatum Hedw. Avalanche Basin, Sperry Glacier, Holzinger Basin.

Dicranum fuscescens Turn. Mt. Stanton and Mt. Trilby. Also at Bigfork (Jones).

Dicranum fuscescens var. **Eatoni** Ren. & Card. Base of Sperry Glacier.

Dicranum fuscescens Turn. a form approaching D. trachyphyllum Ren. & Card. Mts. Stanton and Trilby.

Dicranum Howellii Ren. & Card. Mt. Trilby.

Dicranum longifolium Hedw. Avalanche Trail. McCrimmin Falls.

Dicranum neglectum Juratz. McCrimmin Falls at the north end of Lake McDonald, and along the trail to the river.

Dicranum scopariiforme Kindb. Mt. Trilby, Avalanche Basin.

Dicranum scoparium Hedw. Avalanche Basin.

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Dicranum Starkei Web. & Mohr. Holzinger Basin and from there to the Rim and Sperry Glacier.

Dicranum strictum Schleich. O'Keefe canon, Harris. Also Bigfork and Somers, Jones. Lake McDonald and Swan Lake (Jones).

Dicranella squarrosa (Schrad.) W. P. Sch (Fide Dr. Best). Blackfoot Glacier (Jones).

Fissidens bryoides var. **gynandrus** (Buse) R. Ruthe. Shores of Lake McDonald and Avalanche trail, Sperry Glacier region.

Ceratodon purpureus (L.) Brid. Common everywhere in Sperry Glacier region. Mud Creek, Harris; Bigfork and Belton (Jones).

Distichium capillaceum B. S. Mts. Stanton and Trilby. McDonald Peak in the Mission Mountains, Big fork and Sperry Glacier (Jones). Subalpine (Jones).

Barbula ruralis Hedw. a form. Mts. Stanton and Trilby. O'Keefe canon and McDonald Lake in the Mission Mountains (Harris).

Barbula Mulleri (Br.) B. S. Wild Horse, Bigfork, Alta and Somers (Jones).

Schistidium alpicola (Sw.) Limpr. Mts. Stanton and Trilby.

Barbula aciphylla B. S. Base of Sperry Glacier.

Barbula rufipila Card. & Ther. Bot. Gaz. 29 123 (1900). Avalanche Basin and Holzinger Basin.

Barbula ruralis Hedw. (?) Sperry Glacier (Jones).

Scouleria aquatica Hook. In the Creek through Holzinger Basin, Avalanche Creek.

Schistidium alpicola (Sw.) Limpr. Mts. Stanton and Trilby.

Schistidium confertum (Funck) B. S. Base of Sperry Glacier.

Schistidium gracile (Schleich.) Limpr. Holzinger Basin and Mts. Stanton and Trilby.

Schistidium alpicola var. **rivulare** (Brid.) Wahl. Avalanche Basin, near the Rim at the base of Sperry Glacier.

Grimmia alpestris Schleich. Holzinger Basin, Avalanche Basin, Sperry Glacier.

Grimmia commutata Hub. Mts. Stanton and Trilby.

Grimmia Doniana Sm. Mts. Stanton and Trilby.

Grimmia Holzingeri Card. & Ther. Bot. Gaz. 29 123 (1900). Base of Sperry Glacier and Mt. Trilby.

Grimmia mollis B. S. Base of Sperry Glacier.

Grimmia subsulcata Limpr. in Rabenh. Crypt.. Fl. Laubm, 757. Mt. Trilby.

Grimmia montana B. S. Bigfork, Harris; Wild Horse Island (Jones).

Grimmia calyptrata Hook. Missoula (Harris).

Grimmia tenerrima Ren. & Card. Mt. Trilby, Sperry Glacier, Avalanche Basin.

Grimmia torquata Grev. Mts. Stanton and Trilby.

Grimmia sphaerica Sch. Sperry Glacier (Jones.)

Rhacomitrium canescens Brid. Mts. Stanton and Trilby. Bigfork (Harris).

Rhacomitrium canescens var. **ericoides** Brid. Holzinger Basin.

Rhacomitrium heterostichum Brid. Holzinger Basin.

Rhacomitrium aciculare Brid. Sperry Glacier.

Rhacomitrium patens Hub. Holzinger Basin.

Rhacomitrium Sudeticum B. S. Holzinger Basin. Sperry Glacier, McDonald Peak at 5500° alt. (Jones).

Encalypta contorta (Wulf.) Lindb. McDonald Peak at 5500° alt. (Jones).

Encalypta Macounii Aust. McDonald Lake in the Mission Mountains (Harris).

Encalypta rhabdocarpa Schwaegr. Bigfork (Jones).

Hedwigia ciliata (Dicks) Ehrh. Mts. Stanton and Trilby. Bigfork (Jones).

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Orthotrichum obtusifolium Schrad. On Cottonwoods along Avalanche Trail.

Orthotrichum Schlotthauxeri Vent. Mts. Stanton and Trilby.

Orthotrichum speciosum Nees. Shores of Lake McDonald, Sperry Glacier region. Lake McDonald in the Mission Mountains (Harris). Alta (Jones).

Orthotrichum Kingeanum Lesq. Wild Horse Island (Jones).

Orthotrichum rupestre Schleich. McDonald Lake in the Mission Mountains (Harris).

Orthotrichum affine Schrad. Sperry Glacier (Jones).

Orthotrichum speciosum Nees. (Fide Dr. Best). Sperry Glacier and Swan Lake (Jones).

Orthothecium chryseum Sch. Sperry Glacier (Jones).

Amphidium Californicum L. & J. Mt. Stanton.

Amphidium Papponicum Sch. Base of Sperry Glacier, Mt. Trilby.

Amphidium Mougeottii Sch. On trail from Holzinger Basin to the Rim.

Tetraphis pellucida Hedw. Avalanche Basin and Trail. Bigfork, Yellow Bay and Somers (Jones).

Splachnum luteum L. Bigfork (Jones).

Schistotega osmundacea Web. & Mohr. Trail to Holzinger Basin.

Tayloria serrata B. S. Avalanche Basin.

Funaria hygrometrica (L.)Hedw. Shores of Lake McDonald near McCrimmin Falls. Bigfork and Sperry Glacier (Jones).

Bartramia ithyphylla Brid. Mt. Trilby.

Bartramia Oederi (Gunn.) Schwaegr. Bigfork and McDonald Peak (Jones).

Bartramia pomiformis Hedw. Holzinger Basin. Bigfork (Jones).

Conostomum boreale Sm. Base of Sperry Glacier.

Philonotis fontana var. pumila (Turn.) Dix. Mt. Trilby, Avalanche Basin.

Philonotis fontana Brid. a form heterophylla. On the way to the Rim. A plant from Mt. Edwards near the Rim Mr. Dixon determined as an alpine form of P. fontana approaching P. adpressa Ferguss.

Philonotis fontana var. **alpina** Brd. Blackfoot Glacier (Jones).

Philonotis seriata Mitt. Sperry Glacier.

Philonotis glabriuscula Kindb. Sperry Glacier (Jones).

Webera albicans Sch. a form. Base of Sperry Glacier. Blackfoot Glacier (Jones).

Webera carinata (Brid.) (W. cucullata var. carinata Hurnot). New to North America. Base of Sperry Glacier.

Webera commutata Sch. This approaches close to Bryum filum Sch. which is only a form of W. commutata according to Carnot. Base of Sperry Glacier.

Webera crudis (L.) Sch. Avalanche Basin where it is quite abundant. Bigfork, Blackfoot Glacier and Lamber Valley (Jones).

Webera nutans Hedw. Holzinger Basin and Trail, Mt. Trilby, Avalanche Trail. Also O'Keefe canon (Harris) and Sinyaleamin Lake, Sperry Glacier (Jones).

Leptobryum pyriforme Sch. O'Keefe canon (Harris). Sperry Glacier (Jones).

Bryum alpinum var. **denticulatum** Card. & Ther. Bot. Gaz. 29 123 (1900). On the way from Holzinger Basin to the Rim.

Bryum pallescens Schleich. Mts. Stanton and Trilby.

Bryum pallens Sw. (B. distantifolium R. & C.). (Fide Dr. Best). Swan Lake and Sperry Glacier (Jones).

Bryum lucidum Britton. Shores of Lake McDonald, Sperry Glacier region, near the lower end.

Bryum Duvalli Voit. On the trail to the Rim on Mt. Edwards.

Bryum barbatum Wils. The same (?) as B. Stertoni Sch. Plants very close to this species but not fully agreeing with it. Base of Sperry Glacier.

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Bryum Atwateriae C. Mull. The plants distributed as this species do not fully agree with it and may prove distinct. Mts. Stanton and Trilby.

Bryum caespiticium L. Bigfork (Jones).

Bryum cirrhatum H. & H. Sperry Glacier (Jones).

Bryum purpurascens B. S. Sperry Glacier (Jones).

Bryum Duvalii var. **latodecurrens** C. M. et Kindb. Swan Like (Jones).

Bryum three species too old for determination. Bigfork and Swan Lake (Jones).

Meesia Albertini B. S. (Fide Dr. Best). Blackfoot Glacier (Jones).

Mnium nudum Williams. Avalanche Basin.

Mnium punctatum var. **elatum** B. S. Avalanche Basin. McDonald Lake in the Mission Mountains (Harris).

Mnium spinulosum B. S. Avalanche Basin, McDonald Lake in the Mission Mountains (Harris), Bigfork, MacDougal Peak, Lake McDonald and Swan Lake (Jones).

Mnium venustum Mitt. Mts. Trilby and Stanton. The plants appear to be dioecious. McDonald Lake in the Mission Mountains (Harris).

Mnium insigne Mitt. McDonald Lake in the Mission Mountains (Harris).

Mnium orthorhynchum B. S. McDonald Lake in the Mission Mountains (Harris), Lake McDonald (Jones).

Mnium affina Bland. McDonald Lake in the Mission Mountains (Harris), Somers (Jones).

Mnium Blyttii B. S. Sperry Glacier (Jones).

Aulacomnium palustre Schew. Holzinger Basin.

Aulacomnium androgynum Schw. Holzinger Basin, Mt. Trilby. McDonald Lake in the Mission Mountains (Harris), Bigfork, Alta and Browning (Jones).

Timmia austriaca Hedw. Holzinger Basin.

Timmia austriaca var. **brevifolia** Ren. & Card. Trail to Holzinger Basin.

Timmia megapolitana Hedw. Mud Creek and McDonald Lake in the Mission Mountains (Harris).

Catharinaea Selwyni (Aust.) Kindb. Avalanche Trail, O'Keefe canon (Harris), Bigfork (Jones).

Tortula ruralis Ehrh. O'Keefe canon and McDonald Lake in the Mission Mountains (Harris).

Pogonatum alpinum Roehl. Avalanche Basin below Little Matterhorn.

Pogonatum alpinum var. **arcticum** Brd. Blackfoot and Sperry Glaciers and McDonald Lake, Mission Mts. (Jones).

Pogonatum alpinum var. **simplex** Sch. Sperry Glacier (Jones).

Pogonatum alpinum Roehl. (?) Forms with nearly entire leaves. Sperry Glacier (Jones).

Polytrichum juniperinum (Hedw.) Willd. Avalanche Basin, (Also Umbach), Bigfork, Alta, Belton, Blackfoot Glacier, Lake McDonald, McDonald Lake in the Mission Mountains (Jones).

Polytrichum angustidens Lindb. fil. (See Bryologist for March, 1905, Vol. 8, p. 30. Note). Leaf section and calyptra are distinctive for this species. The author did not refer to the calyptra, the type specimens, collected by Dr. Sandberg in Idaho in 1891, being old. These specimens of Jones show the calyptra very short, covering hardly more than the operculum an important additional character.—J. M. H. MacDougal Peak, alpine (Jones).

Polytrichum piliferum Schreb. Base of Sperry Glacier, Mt. Trilby, Holzinger Basin. O'Keefe canyon (Harris).

Polytrichum sexangulare Floerke. Base of Sperry Glacier. Blackfoot Glacier (Jones).

Polytarichum strictum Menz. Base of Sperry Glacier. (Also Umbach). Sperry Glacier and McDonald Lake in the Mission Mountains (Jones).

Polytrichum formosum Hedw. Alta (Jones).

Neckera Menziesii Hook. Mts. Stanton and Trilby and McCrimmin Falls. Bigfork (Jones).

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Neckera Douglasii Hook. McDonald Lake in the Missión Mountains (Harris).

Climacium Americanum Bird. Bigfork and Lake McDonald (Jones).

Climacium dendroideum (L.) Web. & Mohr. McDonald Lake in the Mission Mountains (Harris), Bigfork, Swan Lake and Mission Creek (Jones).

Fontinalis antiphyretica L. alpine form. Avalanche Trail, Mud Creek (Harris), Hot Springs (Jones).

Dichelyma uncinatum Mitt. Trail to Mt. Stanton.

Pterigynandrum filiforme Hedw. Mts. Stanton and Trilby, Avalanche Trail. Bigfork and McDonald Lake in the Mission Mountains (Jones).

Homalothecium Nevadense Ren. & Cardot. Mts. Stanton and Trilby.

Homalothecium Nevadense var. **subulatum** Ren. & Cardot. Mt. Trilby.

Pseudoleskea radicosa (Mitt.) Lesq. & James. Trail to Holzinger Basin.

Pseudoleskea rigescens Lindb. Holzinger Basin, Mt. Trilby.

Pseudoleskea denudata var. **Holzingeri** Best, in Torr. Bull. 27 229 (1900). Avalanche Basin, Holzinger Basin, Mt. Trilby.

Pseudoleskea atricha Kindb. (Fide Dr. Best). Blackfoot Glacier, Sperry Glacier (Jones).

Pseudoleskea congesta (Wils.) Bry. Eur. (Fide Dr. Best). Blackfoot Glacier (Jones).

Pseudoleskea atrovirens Sch. Blackfoot Glacier (Jones).

Heterocladium procurrens L. & J. Mt. Stanton and Mt. Trilby.

Claopodium Bolanderi Best. Mts. Stanton and Trilby.

Camplothecium lutescens (Huds.) B. S. Bigfork and Wild Horse Island and Alta (Jones).

Camplothecium aeneum (Mitt.) Jacq. Old Stage Station on east side of Flathead Lake on Pinus ponderosa (Harris).

Campylothecium Nuttallii Sch. Alta.

Brachythecium collinum B. S. Mts. Stanton and Trilby.

Brachythecium Leibergii Grout. Holzinger Basin.

Brachythecium rivulare Sch. Avalanche Basin.

Brachythecium salebrosum Sch. Avalanche Basin.

Brachythecium Starkei Sch. Holzinger Basin.

Brachythecium rutabulum var. **flavescens** (Brid.) B. S. Bigfork (Jones), Det. by Dr. J. Grout.

Eurhynchium strigosum B. S. McDonald Lake in the Mission Mountains (Harris). Lkae McDonald (Jones).

Eurhynchium strigosum var. **fallax** Ren. & Cardot. Common on trail to Holzinger Basin.

Thamnium Neckeroides Sch. Trail to Holzinger Basin.

Plagiothecium denticulatum Sch. Holzinger Basin, Mt. Trilby.

Plagiothecium denticulatum var. **microcarpum** Ren. & Card. Avalanche Basin and Trail.

Plagiothecium filiferum Sch. Holzinger Basin, Mt. Trilby, Avalanche Trail.

Plagiothecium elegans Sch. McDonald Lake in the Mission Mountains (Harris).

Plagiothecium sylvaticum Sch., ? Holzinger Basin, Avalanche Trail.

Plagiothecium Sullivantii Sch. Lake McDonald (Jones).

Plagiothecium Millerianum Sch. Lake McDonald (Jones).

Plagiothecium Millerianum Hook. f. (Fide Dr. Best). Lake McDonald (Jones).

Amblystegium varium (Hedw.) Lindb. Mud Creek (Harris), Bigfork (Jones).

Amblystegium varium var. **orthocladon** (L. & J.) form alpinum. Base of Sperry Glacier. (This has been published as new, A. Montanum Bryhn Bryologist, March, 1902, p. 26).

Amblystegium serpens (Hedw.) B S. Bigfork (Jones).

Hypnum aduncum Hedw. Bigfork and Sperry Glacier (Jones.)

Hypnum aduncum group **Kneiffii**. Base of Sperry Glacier.

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Hypnum Bestii Ren. & Bryhn in Bryologist Jan. 1901 p. 12, also April 1901 p. 21, 22. In water, along Avalanche Trail.

Hypnum Cardoti Ther. in Bot. Gaz. Aug. 1900 Vol. 29 p. 124. Avalanche Basin.

Hypnum fluitans L. Daphnia Lake (Harris, also Jones), Sperry Glacier (Jones).

Hypnum fluitans var. **brachydictyon** Ren. in Hurnot Mus. Gall. form Holzingeri Ren. in Bot. Gaz. Aug. 1900 Vol. 29 p. 124. Base of Sperry Glacier.

Hypnum callichroum Brid. Yellow Bay (Jones).

Hypnum giganteum Sch. Mud Creek (Harris), Polson Swamp (Jones).

Hypnum molle Dicks. In water along trail to Holzinger Basin, base of Sperry Glacier.

Hypnum molle var. **Schimperianum** Lortz. In water near the top of Mt. Trilby.

Hypnum ochraceum Turn. Holzinger Basin.

Hypnum ochraseum form tenue. On the way to the Rim at the base of Sperry Glacier.

Hypnum ochraceum var. **uncinatum** Milde. A European moss new to North America. Holzinger Basin.

Hypnum subimponens Lesq. Bigfork (Jones).

Hypnum hamulosum B. S. Bigfork (Jones).

Hypnum polygamum Wils. Bigfork and Somers (Jones).

Hypnum reptile Mx. Bigfork (Jones).

Hypnum uncinatum Hedw. Holzinger Basin and Trail, Mt. Trilby, McDonald Lake in the Mission Mountains (Harris), Somers (Jones).

Hypnum uncinatum form **plumosum.** Mt. Trilby.

Hypnum uncinatum var. **subjulaceum** Sch. form Holzingeri Ren. in Bot. Gaz. 29 p. 125 (1900). Base of Sperry Glacier.

Hypnum uncinatum var. **plumulosum** B. S. Bigfork (Jones).

Hypnum cuspidatum L. Mud Creek (Harris).

Hypnum Schreberi Willd. Holzinger Basin. Somers, Yellow Bay and Bigfork (Jones).

Hypnum stellatum var, **protensum** Sch. Avalanche Basin.

Hypnum symmetricum Ren. & Card. McCrimmin Falls at upper end of McDonald Lake, Sperry Glacier region.

Hypnum crista-castrensis L. Bigfork and Lake McDonald (Jones).

Hypnum circinale Hook. McDonald Lake Mission Mts. (Jones).

Hypnum filicinum. Blackfoot Glacier (Jones).

Hypnum pratense Koch. Sperry Glacier (Jones).

Hylacomium proliferum (L.) Lindb. Avalanche Trail, McDonald Lake in the Mission Mountains (Harris), Yellow Bay (Jones).

Hylacomium robustum Kindb. Shores of Lake McDonald, Sperry Glacier region, Bigfork and McDonald Lake in the Mission Mountains (Jones).

Hylacomium splendens Sch. Avalanche Trail. Lake McDonald (Jones).

Hylacomium squarrosum Sch. Avalanche Basin.

Hylacomium triquetrum Sch. Avalanche Basin, Yellow Bay and Bigfork, Belton and Lake McDonald (Jones).

Limnobium bestii Ren. & Bryhn. Blackfoot Glacier (Jones).

"**Dicranoweisia subcompacta** Card. et. Ther., sp. nova.—Dense pulvinato-caespitosa. Caulis simplex vel parcissime ramosus, 6-8 mm. altus dense foliosus. Folia madida suberecta, sicca crispatula, 1-1.5 mm longa, oblongo lanceolata, acuminata, subacuta vel obtusiuscula, superne, canaliculata, nervo basi attenuato usque ad apicem producto vel paululum infra evanido, marginibus inferne planis, superne inflexis, integerrimis, cellulis, irregulariter quadratis vel subrectangularibus, inferioribus laxioribus, juxta costam linearibus, alaribus distinctis, subinflatis, fuscis. Caetera ignota.

"Very nearly allied to the European **D. compacta** Sch., from which it differs by the leaves being more narrowly acuminate and generally subacute, the cells of the areolation larger and with thinner walls, and chiefly by the costa

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narrower, attenuate below (16 to 25 u broad; it is 55 u in **D. compacta**). Along the trail from Holzinger's Basin to the Rim.

"**Barbula rufipila** Card. et Ther., sp. nova.— **B. aciphyllae** habitu et foliorum forma omnino similis, differt tantum cellulis duplo majoribus et piloque saepius minus denticulata interdum integro. Specimina sterilia. magis distinctis (superioribus 20-30 u in **B. rufipila**, 12-15 u in **B. aciphylla**) Avalanche Basin, Holzinger's Basin.

"**Fissidens bryoides gymnandrus** (Buse) R. Ruthe. New to North America. Cardot det. Shores of Lake McDonald, Avalanche Trail.

"**Grimmia Holzingeri** Card. et Ther., sp, nova. Minima, tenella, pulvinatula, obscure viridis, inferne fusca. Caulis erectus, 4-6 mm. altus, parce ramosus. ramis interdum attenuatis, subflagellaceis. Folia conferta, minima, 0.50-0.70 mm. longa, 0.20-0.35 lata, madida erecta, sicca appressa, breviter ovato-oblonga, concava, omnia mutica obtuse acuminata, marginibus planis integris, costa canaliculata, usque ad apicem producta, basi 28 u lata, cellulis superioribus bistratosis, quadrato-subrotundatis; inferioribus unisthatosis majoribus, lutescentibus, infimis oblongis vel sublinearibus, omnibus incrassatis. Caetera ignota. This very minute species, resembling in habit the small form of **Andreaea jetrophila**, is quite distinct from all the European and North American species of Grimmia with muticous leaves by the small size, and the shape and areolation of the leaves. Base of Sperry Glacier, Mt. Trilby.

"**Grimmia Mollis** B. S. This European alpine moss is reported from Greenland, and should be found at intermediate stations in Canada. Base of Sperry Glacier. No. 17.

"**Grimmia subsulcata** Limpr. in Rabenh. Crytog. Fl., Laubm, 747. New to North America. Cardot det. Mt. Trilby.

"**Webera carinata** (Brid.) (**W. cucilata carinata** Husnot; **Bryum naviculare** Cardot). New to North America. Cardot det. Base of Sperry Glacier.

Bryum alpinum L., var. **denticulatum** Card. et Ther., n. var. A forme typica differt habitu graciliore, foliis ovato-acuminatis, brevioribus, marginibus parum revolutis, superne distincte sinuato-denticulatis, costaque longe ab apice dissoluta. On the way from Holzinger's Basin to the Rim.

"**Pseudoleskea radicosa** (Mull.) Lesq. & James. This species was distributed as **P. regiscens** Lindb.: it is the **P. atrovirens** of European authors. Best det. Holzinger's Basin; Mt. Trilby. No. 46.

"**Pseudoleskea denudata Holzingeri** Best. in Bull. Torr. Bot. Club 27:229, May 1900. Holzinger's Basin, Mt. Trilby, Avalanche Basin.

"**Hypnum Cardoti** Ther., sp, nova. Polygamum, olivaceo-viride, molle, laxiuscule depresso-caespitosum. Caulis procumbens vel ascendens, irregulariter ramosus, 2-4 cm. longus. Folia remotiuscula, patulosquarrosa, interdum subsecunda, e basi constricta anguste decurrente late ovate-deltoidea, subito in acumen angustum breviusculum recurvum protracta, circa 1.5 mm. longa et 0.75 lata, marginibus planis fere undique sinuato-denticulatis, costa simplici-bifurcata vel gemella, crure longiore ad medium producto, cellulis laxiusculis linearibus subflexuosis, basilaribus brevioribus et latioribus, alaribus laxis majoribus subhyalinis. Folia perichaetialia externa ovato-lanceolata, breviter acuminata, subintegra, enervia, intima plicata, costata. Capsula in pedicello rubente valde flexuoso, circa 18 mm. longo, subhorizontalis, arcuata, operculo convexo apiculato. This species is near **H. stellatum** Schreb. and **H. polygamum** Sch. From the first it is at once distinguished by the polygamous inflorescence and the softer leaves with a shorter acumen and a looser areolation. The shape of the stem leaves and of the perichaetical leaves distinguishes it from the small forms of the second species. Avalanche Basin.

"**Hypnum fluitans** L., var. **brachydictyon** Ren. in Husnot Musc. Gall., forma **Holzingeri** Ren. Voisin de la var. **brachydictyon** Renauld, n'en differe que par le port plus grele, la nervure plus etroite, et el tissu delicat. Dioiquell. Cette var., essentiellement alpine, n'avait pas encore, je crois, ete signalee

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en Amerique. A cause de la brievete des cellules medianes, on pourrait confondre cette forme avec **Hypnum aduncum** Hedw.; mais le passage brusque des cellules foliaires de la base aux cellules superficielles de la tige permet d' eviter la confusion. Base of Sperry Glacier.

"**Hypnum ochraceum uncinatum** Milde. A European alpine moss, new to North America. Renauld det. Holzinger's Basin.

"**Hypnum uncinatum** Hedw., var. **subjulaceum** Sch., forma **Holzingeri** Ren. Forme voisine de la forme **orthothecioides** Lindb.; en differe par la couleur verte, les touffes compactes encombrees de terre a la base, l'acumen plus court denticule et le tissu plus delicat, non paisse. Base of Sperry Glacier.

Minor extensions of range will be noted in a fuller report on this collection."—John M. Holzinger, Winona, Minn. Bot. Gaz., Aug., 1900, pp. 122-125.

HEPATICAE, LIVERWORTS.

This list is furnished by J. M. Holzinger of the Minnesota State Normal. Determined by Dr. A. W. Evans.

Asterella gracilis (Web.) Underwood. Sperry Glacier (Jones).

Anthelia julacea (Lightf.) Spruce. Sperry Glacier (Jones).

Blepharostoma trichophyllum (L.) Dumort. Holzinger Basin and Mt. Trilby.

Cephalozia bicuspidata (L.) Dumort. Shores of Lake McDonald, Sperry Glacier region.

Cephalozia media Lindb. Shores of Lake McDonald and Sperry Glacier region.

Chiloschypus polyanthos (L.) Corda. Mostly the var. rivularis Neck. Holzinger Basin and Lake McDonald, Sperry Glacier region.

Gymnomitrium obtusum (Lindb.) Pearson. This species has been reported from Greenland only in America. Mt. Trilby.

Harpanthus flutonianus Nees. A few stems only were found mixed with Scaphania undulata. Holzinger Basin.

Jungermannia barbata Schreb. Shores of Lake McDonald, Sperry Glacier region.

Jungermannia Floerkei Web. & Mohr. Holzinger Basin.

Jungermannia lycopodioides Wallr. Holzinger Basin and Avalanche Basin.

Jungermannia ventricosa Dicks. Very variable and common throughout the Sperry Glacier region.

Jungermannia cordifolia Hook. Blackfoot Glacier (Jones).

Lepidozia reptans (L.) Dum. Shores of Lake McDonald and Mt. Trilby.

Marsupella sphacelata (Gieseke) Dum. Shores of Lake McDonald, Sperry Glacier region.

Metzgeria pubescens (Schrank) Raddi. Avalanche Basin, Holzinger Basin and Lake McDonald.

Porella rivularis (Nees) Trevis. Avalanche Basin, Mt. Trilby and shores of Lake McDonald. Also Bigfork (Jones).

Ptilidium ciliare (L.) Nees. Common at all stations.

Ptilidium Californicum (Aust.) Pearson. Mt. Trilby the eastermost station of the species.

Radula complanata (L.) Dumort. Avalanche Basin, Holzinger Basin, and shores of Lake McDonald.

Scapania nemorosa (L.) Dumort. Shores of Lake McDonald, Sperry Glacier region.

Scapania undulata (L.) Dumort. Holzinger Basin and shores of Lake McDonald.

Marchantia polymorpha L. Belton (Jones).

Pleuroclada albescens (Nees) Spruce. Sperry Glacier (Jones).

In addition to the Hepaticae given above there were found specimens of a sterile **Anthelia**, and of a sterile **Nardia** or **Aplozia**.

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LICHENS.

During the past season no attempt was made to collect lichens, though a few were picked up here and there. The following list is taken mostly from Bulletin No. 19 Biological Series No. 7 of the University, published by Wilson P. Harris and Carolyn W. Harris, as a result of botanizing in this region in 1901, mostly, together with other species collected by Prof. M. J. Elrod. Plants of the Middle Temperate life zones if not otherwise stated.

Acolium tympanellum (Ach.) De Not. Bigfork, Rost and Echo Lakes.

Alectoria jubata (L.) 9815 Jones. Swan Lake.

Alectoria jubata var. **chalybeiformis** Ach. O'Keefe canon.

Alectoria ochroleuca (Ehrh.) var. **rigida** Fr. O'Keefe canon.

Alectoria ochroleuca var. **sarmentosa** Nyl. Rost Lake, Sinyaleamin Lake. Craig Mt. where it is subalpine. MacDougal Peak Elrod, Jones also.

Alectoria Fremontii Tuck. Sinyaleamin Lake, Missoula (Elrod). This is the common black moss, which is particularly abundant on forests at high elevation.

Baeomyces aeruginosus (Scop.) DC. Wolf Creek and Craig Mt. The latter alpine.

Biatora Paddensis Tuck. O'Keefe canon and Rost Lake.

Biatora decipiens (Ehrh.) Fr. Mission Mts.

Biatora rufonigra Tuck. Silloway Peak, alpine.

Buellia petraea (Flot. Koerb) Tuck. var. **Montagnoei Tuck.** On rocks. Missoula (Elrod).

Buellia geographica (L.) Tuck. McDonald Lake in the Mission Mountains.

Buellia oidalea Tuck. Rost Lake.

Calicium quercinum Pers. Echo Lake.

Cetraria platyphylla Tuck. O'Keefe canon, Sinyaleamin Lake, Lolo Hot Springs (Elrod). First two localities Middle Temperate.

Cetraria ciliaris (Ach.) Tuck. Lolo Hot Springs (Elrod).

Cetraria glauca (L.) Ach. O'Keefe canon, McDonald Lake in the Mission Mountains, Mud Creek, Swan Lake, Sinyaleamin Lake. Also Lolo Hot Springs (Elrod), (9817 Jones) Swan Lake.

Cetraria Juniperina (L.) Ach. Sinyaleamin Lake, Swan Lake. Also Lolo Hot Springs (Elrod).

Cladonia amaurocraea (Ll.) Schaer. McDonald Lake Mission Mountains.

Cladonia caespiticia (Pers.) Fl. Silloway Peak, alpine.

Cladonia amaurocraea (L.) Schaer. McDonald Lake Mission Mountanns.

Cladonia crispata var. infundibulifera (Schaer.) Wahl. McDonald Lake in Mission Mountains.

Cladonia coccifera var. **pleurota** (Flk.) Willd. McDonald Lake, Mission Mts.

Cladonia cornuta (L.) Fr. McDonald Lake, Mission Mountains.

Cladonia deformis (L.) Hoffm. Sinyaleamin Lake.

Cladonia digitata (L.) Hoffm. Flathead Lake.

Cladonia fimbriata (L.) Fr. Flathead Lake and Lolo Hot Springs (Elrod) on decaying logs. Swan Lake, Jones.

Cladonia fimbriata var. **radiata** Fr. Missoula (Elrod).

Cladonia fimbriata var. **tubaeformis** Mud Creek.

Cladonia gracilis var. **verticillata** Fr. Sinyaleamin Lake.

Cladonia gracilis var. **symphycarpia** Tuck. Sinyaleamin Lake, McDonald Lake, Mission Mountains. Also Missoula (Elrod).

Cladonia gracilescens (Rab.) Waimo. Rare in N. A.

Cladonia pyxidata (L.) Fr. State Station on Flathead Lake eastern side Bigfork, McDonald Lake. Also Flathead Lake and Missoula (Elrod). Sperry Glacier, Lake McDonald, Jones.

Cladonia turgida var. **conspicua** (Schaer) Nyl. Lolo Hot Springs (Elrod).

Cladonia rangifera var. **sylvatica** L. Sinyaleamin Lake, and McDonald Lake. Also Flathead Lake (Elrod).

Cladonia sylvatica (L). Hoffm. McDonald Lake in the Mission Mountains, Jones.

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Endocarpon miniatum Ach. Sentinel Mt.

Evernia vulpina (L.) Ach. Sentinel Mt. and Sinyaleamin Lake. Also Flathead Lake (Elrod). This is a very common and beautiful yellow lichen. Also (7911 Jones) MacDougal Peak, subalpine.

Lecanora atrata (Huds.) Ach. Flathead Lake and Rost Lake.

Lecanora cervina var. **cinerevella** Fink. Craig Mountain. Alpine.

Lecanora pallescens (L.) Ach. Missoula, growing on mosses.

Lecanora chlorophana (Wahl.) Ach. Craig Mountain. Alpine.

Lecanora punicea Ach. Rost Lake.

Lecanora rubina (Vill.) Ach. Mt. Sentinel. Also Missoula (Elrod).

Lecanora subfusca (L.) Ach. Flathead Lake and Post Creek.

Lecanora xanthophana var. **dealbata** Tuck. Craig Mountain. Alpine.

Leptogium sp. Missoula (Elrod).

Parmelia conspersa (Ehrh.) Ach. Post Creek and McDonald Lake in the Mission Mountains. Also Missoula (Elrod).

Parmelia olivacea (L.) Ach. Mt. Sentinel, St. Ignatius Mission and Post Creek.

Parmelia physodes (L.) Ach. Lolo Hot Springs (Elrod).

Parmelia physodes var. **vittata** Ach. Mt. Sentinel, Sinyaleamin Lake. Also Lolo Hot Springs (Elrod).

Parmelia physodes var. **enteromorpha** Tuck. Lolo Hot Springs (Elrod).

Parmelia saxatilis (L.) Fr. Sinyaleamin Lake. Also Flathead Lake (Elrod).

Parmelia saxatilis var. **sulcata** Nyl. O'Keefe canon and McDonald Lake. Also Lolo Hot Springs (Elrod).

Peltigera aphthosa (L.) Hoffm. Sinyaleamin Lake. Also Missoula, Lolo Hot Springs and Flathead Lake (Elrod). Also (7914 Jones) Bigfork.

Peltigera canina (L.) Hoffm. Sinyaleamin Lake, O'Keefe canon and McDonald Lake in the Mission Mountains. Also Flathead Lake and Missoula (Elrod). Alta.

Peltigera venosa (L.) Hoffm. Bigfork.

Placodium elegans (Link) De. McDonald Lake. Also Missoula and Elrod Peak (Elrod). Sperry Glacier, Jones.

Physcia stellaris (L.) Tuck. St. Ignatius Mission.

Physcia stellaris var. **aipolia** Nyl. Flathead Lake.

Rinodeina oreina (Ach.) Mass. Missoula (Elrod).

Ramalina calicaris var. **fastigiata** Flathead Lake.

Solorina crocea (L.) Sch. Sperry Glacier, Jones.

Stereocaulum alpinum Th. Fr. Sperry Glacier. Rare in North America. Jones.

Sticta pulmonaris (L.) Ach. Mud Creek and McDonald Lake in the Mission Mountains.

Theloschistes Lychnens (Nyl.) Tuck. Bigfork. Also Missoula (Elrod).

Umbelicaria hyperborea Hoffm. McDonald Lake, Mission Mts.

Umbilicaria phaea Tuck. McDonald Lake, Mission Mts.

Umbilicaria vellea (L.) Nyl. McDonald Lake, Mission Mountains. Also Lolo Hot Springs (Elrod).

Usnea barbata (L.) Fr. Mt. Sentinel and Mud Creek. Also Flathead Lake (Elrod).

Usnea barbata var. **hirta** Mt. Sentinel

Usnea cavernosa Tuck. McDonald Lake, Mission Mts.

All my species of lichens have been identified by Prof. Bruce Fink, and are given as collected by myself. Those without collectors' names, were gathered by Harris

ALGAE.

Ricciocarpus natans. Jeff's Cabin, Swan River, Jones. Identified by Prof. Setchell.

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FUNGI.

So far as can be learned there have been but two attempts to collect the fungi on living leaves in our region. No attempt having been made so far to get the immense number growing on dead stems and the ground. A few of these have been picked up incidentally only.

Prin. T. A. Bonser now of the Spokane High School, seems to have made the first collections during his work at the Biological Station. His plants were identified by Prof. Farlow. His list covers 50 species and is embraced in this report.

During the past season I attempted to get all the Fungi on living leaves in the Flathead region. Some were missed doubtless but most of them were found. My list embraces considerably over 100 species. All my plants were identified by Chas. Peck, Esq., of Albany, New York, and Prof. J. C. Arthur of Purdue University, the latter identifications being rusts mostly.

In the descriptions of dimensions of spores "m" stands for thousands of a millimeter (in the absence of the proper sign).

Actinomena Rosae (Li.) Fr. On Rosa gymnocarpa. Dayton.

Aecidium abundans Peck. On Symphoricarpos oreophilus. Lima.

Aecidium Alleni Clint. On Shepherdia Canadensis. Wild Horse Island. Also on the same host by Bonser in Swan river valley. On Elaeagnus argenteus near Dayton. It is very rarely found on this host.

Aecidium Berberidis Pers. Wild Horse Island and Yellow Bay. On Berberis repens.

Aecidium Ranunculacearum DC. On Ranunculus glaberrimus. Lima.

Aecidium Thalictri Grev. On Thalictrum occidentale. MacDougal Peak (Bonser). Also by Jones on MacDougal Peak.

Aecidium cornutum. On Amelanchier alnifolia. Bigfork (Bonser).

Aecidium cornutum. On Amelanchier alinfolia. Bigfork (Bonser).

Agyrium elongatum (E. & E.). On dead stems of Valeriana, MacDougal Peak (Bonser).

Albugo candida (Pers.) Kuntze. On Capsella Bursa-pastoris. Bigfork.

Albugo Bliti (Biv.) Kuntze. On Amarantus blitoides. Bigfork.

Albugo. On Pentstemon confertus. Whitewater.

Ascochyta colorata Peck. On Fragaria vesca. Bigfork.

Caeoma. On Rubus Nutkana. Bigfork (Bonser).

Calyptospora columnaris (A. & S.) Kuhn. On Vaccinium Myrtillus var. microphyllum MacDougal Peak. Alpine.

Cronartium Comandrae Peck. On Comandra pallida at Wild Horse Island and Yellow Bay. Also by Elrod.

Chrysomixa Pyrolae (DC.) Rostr. On Pyrola rotundifolia. Swan river valley (Bonser).

Coleosporium Asteris. On Aster. Swan river valley (Bonser).

Coleosporium Solidaginis (Schw.) Thun. Probably includes C. Asteris. On Aster leaves at Wild Horse Island, Big Arm, Bigfork and MacDougal Peak. Also on Solidago, Swan river valley (Bonser).

Cylindrosporium simile Peck, n. sp. Maculae parvae, paucae sparsaeque vel numerosae et saepe confluentes, angulares, pallidae; acervuli in macula quavis unus multive, plerumque epiphylli, pulvinati vel plerumque nucleatae, brunnei; sporae filiformes, curvatae, continuae, hylinae, plerumque nucleatae, 40-80 x 4 m. (.0016-.0032 unciae longae, .00016 unciae latae). On living leaves of Ceanothus sanguineus. Bigfork and MacDougal Peak, Flathead Lake, Montana, August, Jones. Allied to C. Ceanothi E. & E., from which it differs in the color of the spots and in the longer continuous spores.

Cylindrosporium simile var. **Pruninum** Peck, n. var. Maculae minores, saepe coloratiores; sporae breviores, 30-60 m; basidia longior 15-25 m. In foliis Pruni emarginatae. Yellow Bay on Flathead Lake at 4000° alt. on the slope of the Mission Mts. Some bushes of Prunus emarginata were almost covered with the fungus.

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Cystopus candidus (Pers.) Lev. On Cardamine hirsuta. McDonald Lake in the Mission Mountains.

Dimerosporium Collinsii (Schew.) Thum. On Amelanchier alnifolia at Bigfork. This is very abundant and seems to be affecting the fruit trees very injuriously.

Doassansia Sagittariae (West) Fisch. On Sagittaria arifolia at Swan Lake.

Doassansia Alismatis (Nees) Corn. On Alisma Plantago at Swan Lake.

Dothidea Pteridis, Phyllachora, Cryptomyces, all stages of the same fungus. On Pteris aquilina. Bigfork (Bonser). Probably the same as Uredinopsis Pteridis Diet. & Holway which I also got at the foot of MacDougal Peak on the same host.

Erineum. This was once supposed to be a fungus but now is regarded as a disease caused by mites. On Acer glabrum at Bigfork. Common.

Erysiphe Polygoni DC. On Polygonum aviculare at Wild Horse Island.

Erysiphe Polygoni var. On Lupinus at Bigfork(Bonser).

Gymnosporangium Nelsoni Arthur. On Amelanchier alnifolia at Yellow Bay.

Hydnum. The coral fungus. This was scarce but very beautiful. Polson.

Linospora Brunellae E. &. E. OnBrunella vulgaris at Swan Lake.

Marssonsia Potentillae (Desm.) Fisch. On Potentilla on Nigger Prairie Trail. Bonser.

Melampsora Medusae Thum. This is the same as Uredo Medusae (Thum.) Arthur. On Populus trichocarpa at Bigfork by Bonsor, and by myself on Populus tremuloides at Bigfork.

Melampsora Bigelovii. On Salix at Bigfork by Bonser.

Melampsoridium Betulae (Schum.) Arthur. On Betula glandulosa at MacDougal Peak. Also on B. alba at Dayton.

Melampsoropsis Pyrolae (D.C.) Arfthur. On Pyrola rotundifolia at Bigfork. This is probably the same ac Chrysomixa reported above by Bonser.

Microsphaeria Alni (Wallr.) On Vicia Americana at Bigfork by Bonser.

Microsphaeria Alni var. **ludens.** Salm. On Vicia Americana at Big Arm.

Microsphaeria Alni var. **divaricata.** On Ceanothus sanguineus at Bigfork by Bonser.

Microsphaeria diffusa C. & P. On Symphoricarpos racemosus at Bigfork. Also on the same host and locality by Bonser.

Peridermium Balsameum Peck. On Abies grandis at Swan Lake and MacDougal Peak and Yellow Bay.

Peridermium pseudo-balsameum (Holway). On Abies grandis at Bigfork by Bonser.

Peridermium ornamentale Arthur. On Abies lasiocarpa at MacDougal Peak, alpine.

Peridermium Pini. On Pinus ponderosa at Bigfork by Bonser.

Phragmidium affine Sydow. On Potentilla flabelliformis at Monida.

Phragmidium occidentale Arthur. On Rubus Nutkana at MacDougal Peak and Bigfork.

Phragmidium "tuberculatum." On Rosa at Bigfork by Bonser.

Phragmidium montivagum Arth. On Rosa gymnocarpa at Bigfork.

Phoma Lupini. On Lupinus on the MacDougal Peak trail, Bonser.

Phoma. On Arctostaphylos Uva-Ursi at Bigfork by Bonser.

Phyllosticta Angelicae Sacc. On Angelica Lyallii at Swan Lake.

Phyllosticta Arnicae Fckl. On Arnica cordifolia. Evaro.

Physoderma vagans Schroet. On Sium cicutaefolium at Bigfork.

Podosphaeria oxyacanthae (DC.) DeBary. On Prunus demissa. Ravalli.

Polythelis Thalictri (Chev.) Arthur. This is the same as Puccinia Thalictri Chev. On Thalictrum occidentale on slopes of MacDougal Peak.

Puccinia Absinthii (DC.) On Artemisia Ludoviciana at Polson by Bonser.

Puccinia acuminata Pp. On Cornus Canadensis on Swan river (Bonser).

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Puccinia Agropyri E. &. E. On Agropyron divergens at Bigfork.

Puccinia arnicalis Peck. On Arnica cordifolia at Bigfork.

Puccinia Asteris. On Aster at Bigfork by Bonser.

Puccinia Arabis (probably the same as P. Holboellii). On Arabis on Swan river by Bonser.

Puccinia Balsamorhizae Peck. On Balsamorhiza sagittata at Wild Horse Island and Bigfork. Also on the same host at Polson by Bonser.

Puccinia Circaeae Pers. On Circaea Pacificia at Swan Lake and on Circaea alpina at Bigfork. Also on C. Pacifica on Swan river by Bonser.

Puccinia Clarkiae. On Clarkia pulchella at Bigfork (Bonser). Ronan, Jones.

Puccinia Dayi Clint. Not before reported west of the Mississippi Valley. On Steironema ciliatum at Wild Horse Island.

Puccinia Gentianae (Strauss.) Link. On Gentiana affinis at Big Arm.

Puccinia gigantospora Bubak. On Anemone multifida at Monida.

Puccinia graminis. On "grass" at Echo Lake (Bonser).

Puccinia hemispherica (Peck.) E. & E. On Lactuca pulchella at Whitefish.

Puccinia Heucherae (Schew.) Dietr. On Mitella nuda at Bigfork and MacDougal Peak, and on Tiarella unifoliata at Swan Lake. Also on Saxifraga on Swan river by Bonser.

Puccinia Hieracii (Schum.) Mart. On Hieracium Canadense at Bigfork. Also by Bonser on same host and at same locality.

Puccinia Holboellii (Hornem.) Rostr. On Arabis Holboellii at MacDougal Peak in the Upper Temperate life zone.

Puccinia intricata var. **Eriogoni.** On Eriogonum at Flathead Lake by Bonser.

Puccinia Menthae Pers. On Monarda fistulosa at Big Arm, Bigfork and Wild Horse Island, also Mentha Canadensis at Whitefish and Bigfork. Also on Mentha on Swan river by Bonser.

Puccinia melanocoides. On Dodecathon at Monida.

Puccinia mesomegala B. &. C. On Clintonia uniflora at Bigfork and MacDougal Peak. Also at Nigger Prairie on same host by Bonser.

Puccinia Physostegiae P. &. C. On Physostegia parviflora. Not heretofore known west of Indiana.

Puccinia Polygoni-amphibii. On Polygonum at Swan Lake by Bonser.

Puccinia pulverulenta Crev. On Epilobium adenocaulon at St. Ignatius Mission.

Puccinia punctata. On Galium boreale at Bigfork by Bonser.

Puccinia recedens Syd. On Senecio balsamitae at Swan Lake.

Puccinia subnitens Diet. On Distichlis spicata at the Hot Springs.

Puccinia Symphoricarpi Hark. On Symphoricarpos racemosus at MacDougal Peak and Swan Lake. Also by Bonser at Bigfork on same host.

Puccinia Troximontis Peck. On Troximon grandiflorum at Wild Horse Island.

Puccinia Violae (Schum.) DC. On Viola Canadensis at Dayton and Bigfork and on V. canina at MacDougal Peak.

Puccinia. On berberis repens at Yellow Bay and Wild Horse Island. See Aecidium.

Puccinia. On Thalictrum occidentale at MacDougal Peak. See Aecidium.

Puccinia Jonesii Peck. On Leptotaenia filicina. McDonald Lake in the Mission Mountains.

Puccinia Gayophyti Peck. On Gayophytum diffusum. Darby.

Pucciniastrum Myrtilli (Schum.) Arthur. On Vaccinium myrtilloides at Yellow Bay and Bigfork. On Vaccinium Myrtillus var. microphyllum at MacDougal Peak, where it is subalpine. Also on Vaccinium on Hall's Peak by Bonser.

Pucciniastrum pustulatum (Pers.) Diet. On Epilobium spictatum at Bigfork on Epilobium adenocaulon at Bigfork. Also on Epilobium at Echo Lake by Bonser.

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Pucciniastrum Pyrolae (Pers.) Diet. On Pyrola secunda at Yellow Bay. Also on Pyrola on Swan river by Bonser.

Pyrenophora fenestrata Peck. On Dead stems of Astragalus Bourgovii, MacDougal Peak.

Rhytisma Arbuti Phill. On Menziesia glabella at Hall's Peak, Bonser. Also by Jones on same host at MacDougal Peak and Bigfork.

Roestelia tubulata Kern n. sp.

Pycniis epiphyllis, numerosis, in greges irregulares dense confertis, maculis decoloratis insidentibus, cylindraceis. 2-3.5 mm. altis, 0-0.4 mm. diam., apice persistentes cohaerentibus; peridio firmo; cellulis peridiis fusoideo-oblongis, 17-25 m x 48-80 m, rugoso; aeciosporis globosis vel subglobosis, 18-22 m x 21-28 m; episporio castaneo-brunneo, 1.5-2.5 m. crasso, subtiliter verruculoso; poris germinantionis 6-8, sine ordine dispersis.

Habitat in foliis Crataegi Douglasii Lindley. Polson prope Flathead Lake in Montana Americae bor. 840 m. alt. Aug. 19 1908. Coll. Marcus E. Jones.

This species is characterized by its firm tube-like peridium which does not rupture at the apex but by longitudinal slits in the lower part. In its firmness and in its tendency to maintain its tubular form without becoming lacerate above it has a resemblance to Roestelia cornuta (Pers.) Fries on Sorbus. It differs from that species, however, in its more slender peridia, and in the size and surface-marking of the peridial cells. The peridial cells have a considerable resemblance to those of Roestelia globosa Farl. but it is very much unlike that species in the size of the peridia and in their manner of rupturing.

Roestelia Nelsoni Arthur. On Amelanchier alnifolia at Bigfork.

Roestelia tubulata Kern. On Crataegus allied to coccineus at Polson. On Crataegus Douglasii at Bigfork.

Roestelia cornuta Ellis. On Pyrus "Sitchensis" at Hall's Peak.

Septoria saccharina var. **occidentalis** E. &. E. On Acer glabrum at Yellow Bay, Bigfork and MacDougal Peak.

Septoria sorbi Lasch. On Pyrus sambucifolia at Yellow Bay and Bigfork. On P. "Americana" at MacDougal Peak, alpine.

Septoria salicifoliae. On Spiraea at Bigfork by Bonser.

Septoria Streptopidis Peck n. sp. Maculae subangulares, 2-8 mm. (x 1-4 mm.) latae saepe confluentes flavidae, brunneae vel rubrobunneae; perithecia amphigena, membranacea, inaequalia, atra, in macula quavis unum multave; sporae numerosae, elongatae, cylindraceae vel subfiliformes, curvatae, plurinucleatae, 30-89 x 4-5 m., ex perithecia exudantes et massam albidam formantes. On living leaves of Streptopus roseus and Prosartes trachycarpa at Yellow Bay, Swan Lake, MacDougal Peak and Bigfork.

Sphaerella Chimaphilae (E. & E.). On Chimaphila umbellata at Bigfork by Bonser.

Sphaerotheca Humuli (DC.) Burr. On Sium cicutaaefolium at Bigfork.

Triphragmium clavellum. On Aralia at Swan Lake by Bonser.

Thecaspora deformans Dur. & Mort. On Rubus Idaeus. Whitefish. On Astragalus flexuosus, Browning.

Uncinula Salicis. On Salix at Flathead Lake by Bonser.

Uredo confluens Pers. On Salix Scouleriana at Bigfork.

Uredo Lini Schum. On Linum Lewisii at Wild Horse Island.

Uredo Medusae (Thum.) Arthur. On Populus tremuloides at Bigfork .

Uredo Bigelovii (Thum.) Arth. On Vaccinium. Sperry Glacier, Alta.

Uredo Polypodii DC. On Cystopteris fragilis. Blackfoot Glacier.

Uromyces albus D. & H. On Vicia Americana at MacDougal Peak.

Uromyces Aristidae E. &. E. On Plantago Tweedyi in Deer Lodge Valley.

Uromyces Astragali (Opiz.) Schroet. On Oxytropis albiflorus at Wild Horse Island.

Uromyces Erythronii (DC.) Lev. On Erythronium grandiflorum var, minus at MacDougal Peak, alpine.

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Uromyces Euphorbiae C. & P. On Euphorbia serpyllifolia at St. Ignatius Mission.

Uromyces fabae (P.) Schroet. On Lathyrus "parvifolius" at Echo Lake by Bonser.

Uromyces Glycyrrhizae Magn. On Glycyrrhiza lepidota at Dayton and Wild Horse Island.

Uromyces Hedysari-obscuri. On Hedysarum flavescens at MacDougal Peak by Elrod.

Uromyces unitus Peck. On Lewisia rediviva at Missoula.

Uromyces borealis Peck. On Hedysarum sulphurescens. Como Peak, Browning, Blackfoot Glacier.

Uromyces Astragali (Opiz.) Sacc. On Astragalus alpinus. Bigfork.

Ustilago Mulfordiana. On Festuca tenella at Kalispell by Bonser.

Ustilago bromivora (Tul.) Fisch. On Bromus secalinus at Wild Horse Island. On Bromus Pumpellianus at Bigfork. On Stipa comata at Bigfork.

Ustilago. On Carex nardina. Sperry Glacier, also Carex atrofusca in the Mission Mountains.

Uredinopsis Pteridis Diet. & Holway. On Pteris aquilina at MacDougal Peak.

Uredinopsis Struthiopteridis Storm. On Aspidium Filix-Mas at MacDougal Peak. "This gives a new host for the species, and also greatly extends the range. Heretofore has been known only from Vermont and Newfoundland." Arthur.

Uropyxis sanguinea (Peck) Arthur. On Berberis repens at Yellow Bay, Wild Horse Island and MacDougal Peak.

Besides the above fungi the following were gathered but not in determinable condition.

On Prosartes rosea. Bigfork.
On Echinospermum. MacDougal Peak.
On Saxifraga punctata. McDonald Peak.
On Ribes lacustre. Bigfork.
On Parnassia fimbriata. Bigfork.
On Poterium. St. Ignatius Mission.
On Smilacina sessilifolia. Bigfork.
On Petasites. Whitefish.
On Galium boreale. Wild Horse Island.
On Leptotaenia filicina. Wild Horse Island.
On Spiraea. Bigfork.
On Hedysarum flavescens. MacDougal Peak.
On Vicia Americana. Whitefish.
On Astragalus leptaleus. Big Arm.
On Anemone nemorosa. MacDougal Peak.
On Poa alpina dead leaves. MacDougal Peak.
On Habenaria dilatata. Yellow Bay.
On Juncus Balticus. Monida.
On Juncus Mertensianus. MacDougal Peak.

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LOCALITIES.

Alta, a station at the head of Bitter Root Valley.

Avalanche Basin, below Sperry Glacier.

Bigfork, the location of the University of Montana Biological Station, at the outlet of Swan River into Flathead Lake.

Blackfoot Glacier, on the north slope of Blackfoot and the south and east slopes of Jackson Mountains main range of the Rockies, the drainage into St. Mary's Lake, and the Hudson Bay drainage.

Belton, on the Great Northern railway, on the Middle Fork of Flathead River.

Bull Island, one of the chain of islands in the lower portion of Flathead Lake.

Browning, on the Great Northern railway, Blackfoot Indian Reservation.

Big Arm, the large western projection of Flathead Lake.

Como Peak, in the Bitter Root Mountains, opposite the postoffice Como. Colville.

Darby, a town in the upper Bitter Root valley.

Dayton, postoffice at the Big Arm of Flathead Lake.

Daphnia Pond, at Bigfork, upper end of Flathead Lake.

Durant, railroad junction 15 miles east of Anaconda.

Elrod Peak, between the South and Middle Forks of Flathead River, one of a series of bald crags of yellow argillite, the waters from the north glacier flowing into Stanton Lake, from the west, forming creek which flows into the South Fork. Elevation 9,500 feet.

Evaro, station on the Northern Pacific railroad, summit or pass in the Cabinet Mountains, 16 miles from Missoula.

Echo Lake, a small lake in the wooded valley west of the Swan Range, near Bigfork.

Edwards, Mt., touching Sperry Glacier on the southwest.

Flathead Delta, upper or northern end of Flathead Lake, where Flathead River enters. The delta is formed by the old and present channels of the river.

Gunsight Pass, over the main Rockies between Gunsight and Jackson Mountains.

Gunsight Lake, between Gunsight and Jackson Mountains, on the Hudson Bay side, along the trail over Gunsight Pass.

Garrison, town on the Northern Pacific railroad, junction of Deer Lodge and Little Blackfoot Rivers.

Hot Springs, on Flathead Reservation, 35 miles west of Polson, and 25 miles from Plains, the former at the foot of Flathead Lake, the latter on the Northern Pacific railroad.

Haggin, Mount, south of Anaconda, continental divide.

Holzinger Basin, at an elevation of about 6,500 feet, along the trail from McDonald Lake to Sperry Glacier up Snyder Creek.

Jordan Lakes, two small lakes on the southwestern slope of McDonald Peak in the Mission Mountains, not far from Mission Valley proper.

Lambert Valley. A small valley at higher elevation (7,000 feet) in the Mission Mountains, on the south side of Mission Creek, back of (east of) the high unnamed peak next to Mission Valley.

Little Bitter Root, river and valley, in Flathead Indian Reservation. The valley is the old river valley which was the former outlet of Flathead Lake.

Lincoln Pass, on the trail from Lake McDonald to Gunsight, pass between Gunsight and Lincoln Peaks.

Little Matterhorn, a sharp point of rocks at foot of Sperry Glacier, jutting out from Edwards.

Lake McDonald, a few miles from Belton on the Great Northern railroad. 12 miles long and about two miles wide; not to be confused with McDonald Lake in the Mission Mountains, 80 or 90 miles further south.

Lake Louise, between Gunsight and Jackson Mountains, along Gunsight trail. Elevation about 6,000 feet.

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Lo Lo Mountains, southwest of Missoula, 9,500 feet elevation.

MacDougal Peak, in the Swan Range, over the shoulder of which the old Aeneas trail leads. Elevation 7,600 feet.

Mission Creek, in the Mission Mountains, heading in immense snowfields, flowing westward past St. Ignatius, emptying into the Pend d'Oreille River.

McDonald Peak, Mission Mountains, elevation 10,100 feet.

Monida, on the summit between Montana and Idaho, on the O. R. and N. railway.

Mud Creek, heading in the Mission Mountains, flowing westward across Mission Valley in Flathead Indian Reservation.

Nigger Prairie, an opening in the woods east of Bigfork, some new mines.

O'Keefe Canyon, about eight miles northwest of Missoula.

Polson, a town at the foot of Flathead Lake.

Polson Swamp, near Polson.

Ravalli, on the Northern Pacific railroad, Flathead Indian Reservation, 37 miles from Missoula.

Ronan, town on Flathead Reservation, in Mission Valley.

Rost Lake, a small lake a mile in diameter, in the timber at the foot of MacDougal Peak, Swan Range, Flathead Valley.

Ryan's Lake, on the slopes of Mt. Powell, Deer Lodge valley.

Rexford, a station on the Great Northern near the Canadian line, west of Whitefish.

Rim, the, rock cliff at the end of trail up Snyder Creek, at the southern edge of ice of Sperry Glacier.

Sperry Glacier, resting on the western slope of the main Rockies in a depression between Gunsight and Edwards Peaks, reached by trail from Lake McDonald either from the south side, easily, or with more difficulty by trail up Avalanche Basin.

Silloway Peak, in the Swan Range, a few miles south and a little east of MacDougal Peak, with triple summit, the highest 7,600 feet.

Swan Lake, between Mission and Swan Ranges, twelve miles long, an expansion of Swan River.

St. Ignatius, on Flathead Reservation, in Mission Valley.

Stanton Lake, three miles west of Great Northern railway, near Nyack.

Silver Bow, railway junction near Butte.

Somers, town on the northwest corner Flathead Lake.

Schultze's Cabin, a point on the Aeneas trail from Flathead Lake across Swan Range, the farthest point to which wagons may be taken.

Stanton, Mt., at upper end of Lake McDonald, northwest of the lake.

Sentinel, Mt., also called University Mountain, just east of the University of Montana campus at Missoula.

Thompson Falls, a town in Western Montana, near the state line, on the Northern Pacific railroad.

Trail Creek, a creek on the eastern face of the Swan Range, just north of MacDougal Peak, flowing into the South Fork of Flathead River..

Wild Horse Island, large island in the western or Big Arm of Flathead Lake.

Whitefish, on the Great Northern railroad, near Kalispell.

Whitewater.

Yellow Bay, on the eastern side of Flathead Lake, midway.

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ADDENDA.

Since the preceding was set in type the following notes on species and descriptions of new species have been prepared, and are inserted.

The following notes may help to clear up the relationships of two sedges in our region. William Boott first separated one species and Bailey the other. Boott in his description of C. luzulaefolia confounded the two species, as they grow together in the Sierras. This is shown by the names he gave to my material. Mackenzie has also tried to separate the Nevada form of ablata which verges toward C. luzulaefolia, but it is not distinct.

Common characters are Upper spikelets sessile or nearly so, not linear, the lower mostly clavate, on elongated and filiform peduncles. Perigynia green or rusty with age, slightly inflated, the lanceolate, body nearly filled by the seed, with triangular and substipitate base, and tapering into a flat triangular beak which is scabrous and papillose and deeply 2-toothed and purple-striped down the middle, the upper half empty, a little inflated, papery, strongly nerved on the sides and faintly nerved on the face, green till mature, not less than 4 mm. long, a little longer than the scale, spreading. Bracts green and leaf-like, shorter or little longer than the blade, not as long as its sheath which is light colored and with rusty ring at tip. Sheaths widening a little above. Leaves many, broad and flat, 3-9 mm. wide, shortly acuminate, yellowish, smooth, rarely more than 1-2 dm. long, gradually reduced above along the stems to bracts, the central sheaths often 1 dm. long, the upper bracteal ones barely less than 2 cm. long. Stems at base clothed with coarse leaf fibers, often 8 mm. thick, gradually tapering at tip to almost filiform, about 3 feet high and erect, few together from very shortly stoloniferous rootstacks often 1 cm. thick. Plants of dry meadows at high elevations.

Luzulaefolia W. Boott Bot. Cal. 2 250 (1880), in part. C. fissuricola Mackenzie, (Luzula-leaved Sedge.) Spikelets 2-3 mm. long, 6-9 mm. wide, the upper ones clustered and nearly sessile. Perigynia 6 mm. long and 2 mm. wide, punctate and slightly granulated above, straight, beak about half the whole, green or rusty only. Scales dark-brown with light center, scarious margin hardly any and strong midrib going to the tip or projecting as a short awn or mucro. Leaves 4-9 mm. wide, shortly acuminate, quickly reduced to scales at base of stems. Wasatch mountains, Utah, westward and northward.

Oblata Bailey. Bot. Gaz. 13 82 (1888) (oblate Sedge). Spikelets 1-2 cm. long, the sterile 7-15 mm. long and often compound, 2-8 mm. wide, sometimes fertile in the middle, mostly clavate; fertile ones club-shaped, 1-2 cm. long, 3-6 mm. wide, only the uppermost one sessile, the rest on variously elongated peduncles, dark-brown. Perigynia with beak about ⅓ the whole, smooth, about 3 mm. long, and 2 mm. wide, with recurved tip. Scales purple with light center, ovate to oblong, obtuse, ovate to oblong, with broad hyaline and white and lacerate margins and tip, the midrib not reaching the tip. Leaves about 3 mm. wide, long-acuminate, rarely at all reduced below. Rather common in the Sierras. This probably includes C. herbariorum. First published as ablata, but intended for oblata. The Utah forms referred here are better placed in luzulaefolia. Kukenthal is probably right in placing this as a variety of luzulaefolia, since the Utah and Nevada material has sharp scales and less hyaline and longer perigynia.

Two other sedges on which our field work throws much light are Montanensis and Tolmiei. They belong to the same group as those above but verging toward the atrata group in the flattening of the perigynia and the reduction of the beak.

Common characters are: Spikelets purple, from almost black to chestnut colored, small, short, oblanceolate to ovate, compactly flowered, contiguous (or amounting to that by the elongation of the lower peduncles), the stami-

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nate single. Perigynia oval-ovate, about 3 mm. long by 2 mm. wide, nearly flat above and triquetrous below, thin and papery, fully twice as large as the smooth seed and empty above, finely punctate when young and granulated when ripe, white when young and nearly black, at least at tip, when old, with two lateral nerves and faint green lines abruptly contracted into the face when young but appearing nerveless, spreading at about 45° angle, sessile, with cylindrical beak about twice as long as wide. Scales very dark with narrow green midrib. Bracts broad and leaf-like, nearly as wide as the leaves with subulate tip, many times longer than the very short sheaths, but not overtopping the stems. Leaves very dark-green, mostly 1-2 dm. long, quickly reduced to chestnut-colored scales below, shortly acuminate, flat and smooth, leathery without fibrillose sheaths. Stems tapering from base to slender tip, 1-1.5 feet high, growing in large clumps from shortly stoloniferous rootstocks which are densely clothed with coarse leaf fibers and appearing as if abruptly decumbent at base, leafy only on the lower third, sharply 3-angled. Plants of alpine meadows, not in wet places.

Carex Tolmiei Boott in Hook. Fl. Bor. Am. 2 224 (1840). (Tolmie's Sedge). All but the lower spikelets sessile and mostly overlapping, mostly oblong-oblanceolate,, rarely oval and then very small, the upper ones conspicuously smaller, the staminate one a little longer and wider than the rest, erect or nearly so. Scales lanceolate, acute, fully as long but a little narrower than the perigynia. Bracts with black auricles, but some of them with very short sheaths. Leaves 3-4 mm. wide. Mt. Powell and Sperry Glacier region. This has all the appearance of a hybrid between C. atrata and C. Montanensis with which it grows.

Carex Montanensis Bailey Bot. Gaz. 17 152 (1892). (Montana Sedge). All Spikelets but perhaps occasionally the uppermost fertile one on capillary and drooping peduncles from half to four times the length of the spikelets, fully developed ones about 2 cm. long and 5 mm. wide, narrowly oblong, the staminate one smaller and oblanceolate to obovate, all the fertile ones about the same length though the uppermost one when sessile is often minute and very few flowered. Scales mostly ovate and barely acute, sometimes lanceolate and acute from half to nearly as long as the perigynia, often entirely purple. Bracts with chestnut-colored auricles and the lowest with sheaths about 1 cm. long. Leaves 2.5-3 mm. wide. Stems mostly densely clustered as if caespitose but the crowns are distinctly separate. This is the most common sedge, having the habit of C. limosa, in all the alpine meadows of nothwestern Montana, and if not the same as C. atrofusca is at least very near it.

Carex aboriginum n. sp. Stems shortly stoloniferous, rigid, erect, smooth, obtusely 3-angled, finely papillose, about 3 feet high, leafy on the lower third, slender. Leaf sheaths hyaline and not fibrillose. All the leaves about half the stems, not reduced below, flat, 3 mm. wide, long-acuminate, smooth, light-green, bases light colored. Bracts green and subulate pointed, the lower 2-3 dm. long. Spikelets all peduncled, the upper fertile ones very shortly so, the single terminal and staminate one on a filiform peduncle nearly its own length and oblanceolate, about 2 cm. long and 3 mm. wide, fertile spikelets 2-3, nearly contiguous, oval, about 15. mm. long and 12 mm. wide, compactly flowered, the upper flowers spreading and the lower mostly reflexed at maturity by the crowding of the perigynia, about 25-30 flowered, fuscous with age. Perigynia about 6 mm. long and 3 mm. wide, ovate, decidedly inflated, papery, whitish and becoming fuscous when ripe. Somewhat flattened above, triquetrous but with only 2 strong lateral nerves and about 5 finer ones on the faces, finely punctate all over, which becomes almost papillose with age, half filled by the spherical seed, minutely and abruptly stipitate; beak flattened, serrate, papillose, purple, deeply notched and 2-toothed, scarcely more than a triangular prolongation of the perigynia and about as long as wide below. Scales lanceolate, acuminate purplish, with a light center, nearly as long as the perigynia but much narrower, scabrous on the midrib. Stigmas 3.

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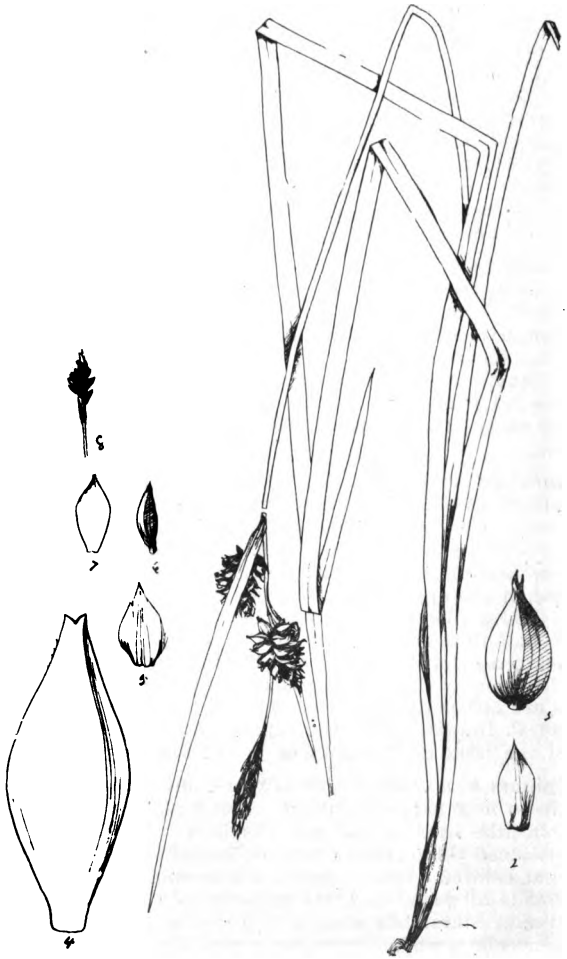
This grows on dry gumbo soil which is wet in the spring. It has the habit of C. Gmelini and is nearest related to Raynoldsii, though having fruit characters between that and ablata. Indian Valley, Southern Idaho, near Salubria, July 12, 1899. Middle Temperate life zone.



Carex aboriginum, 1, 2, 3.
Carex nardina (from Britton, x9) 4.
Carex stantonensis, 5. 6. 7. 8.

Carex Elrodi n. sp. Spikelets 3-5, the terminal one all staminate or with a few fertile flowers at tip, not over 2.5 cm. long, about 2 mm. wide, sessile, the rest fertile, sessile (the lower short-peduncled and rarely on a long and filiform radical peduncle), shorter, all linear except the very short subterminal ones, 3 mm. wide, chestnut-colored, contiguous, appressed, compactly flowered. Perigynia oval, plano-convex with sharp sides, papillose, abrutly contracted at base to a short stipe and at tip to a short bidentate beak not

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over ¼ the whole, or reduced to a rudiment, lateral ribs prominent, faintly 1-2-ribbed on the face, mostly green, sometimes purplish above, closely appressed, 2 mm. long. Scales very broadly ovate, barely acute to cuspidate, dark-chestnut colored with broad and white hyaline edges, as long as the perigynia. Bracts very short and scale-like except the lowest which has a subulate and green tip 1-3 cm. long, sheathing with purple arricles, at least

Carex Parryana var. Statoni, 1, 2, 3.
Same, smaller specimen, 4. 5.
Carex Goodenovii var. dolia, 7, 8, 9, 10.

the lowest ones. Leaves all basal or nearly so, rarely 1 dm. long, 3-5 mm. wide, feeling smooth, but finely papillose, subulate acuminate, stiff, flat, splitting up into coarse chestnut-colored fibers below, sheaths slightly fibrillose, green. Stems obtusely angled, erect .5-1.5 ft. high, smooth, widely stoloniferous, narrow. This grows in dry meadows along with C. Parryana. Monida,, Montana. Middle Temperate life zone. This comes in the 3-stigma group with sessils perigynia and granular, and is related to C. Richardsoni. Dedicated to Prof. M. J. Elrod. Figured on P. 19 as Parryana var. Hallii.

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Carex Parryana var. **Statoni** Jones n. var. Spikelets 3-4, all sessile, congested into an ovate to oblong head, rusty, the terminal one 1.5-2 cm. long, the rest somewhat smaller to a third as long, all oblong, densely flowered, 3-6 mm. wide, appressed, the terminal one thickest. All wholly pistillate or with a few staminate at tip. Perigynia trigonous, rhomboidal obovate, the base with a substipitate spongy thickening, the tip triangularly contracted into narrow tip or beak not much longer than high, which is oblique, hyaline and notched, strongly 3-nerved with two on the sides and one on the inner face and all rounded and thickened, with 6-8 fine nerves on the outer face, granulated, 2 mm. long and 1 mm. wide and about half as thick, rusty colored. Scales ovate, acute, a little longer than the perigynia, rusty. Stigmas mostly two though frequently 3-stigma flowers are intermixed. Bracts all brown and scale-like, sheathing. Stems sharply-triangular, about 6 dm. high, erect but slender, leafy only near the base, stoloniferous, granulated but seeming smooth. Leaves 2-3 mm. wide, revolute, acuminate, about a third as long as the stems, papillose, with fibrillose sheaths, light-green. Growing in dry meadows. Deer Lodge Valley, Montana. The type collected at Ryan's ranch, Aug. 3rd, 1905. Dedicated to W. C. Staton of Anaconda. I also refer to this material got in the same valley in July, which is only 2 dm. high, with smaller spikes and scales, hardly as long as the perigynia, though having the same rusty color, with the light center and very narrow wihte edges of the type and the perigynia fully 2-3 times as thick as wide and like the type filled by the seed. This would seem to come near to C. Idahoa Bailey.

Carex Goodenovii var. **dolia** Jones n. var. Spikelets all on filiform peduncles, 2-10 mm. long, clustered in a deltoid head, 3-5, 5-15 mm. long and about 3 mm. wide, densely flowered, broadly linear, nearly black and with green perigynia, the terminal one with a few staminate flowers at the base and then clavate, or rarely at both tip and base. Perigynia broadly ovate, granulated, nerveless except the two lateral ones at the tip, plano-convex, 2 mm. long, green or flecked with purple above, sessile and with a spongy ring at base, filled by the seed, with a minute cylindrical beak not longer than high, appressed. Scales oblong, rounded and obtuse, black with light center, nearly as long as the perigynia. Bracts setaceous, green, with black auricles, the lower often 1 dm. long, sheathless. Stems filiform, 1.5-2 dm. high, nodding, obtusely angled, papillose as well as the leaves, densely caespitose, leafless except at very base. Leaves dark-green, 2-3 mm. wide, involute, shortly acuminate, about half as long as the stems, with hyaline nonfibrillose sheaths. Growing in dense mats above timber line at Sperry Glacier, Montana, in moist meadows. This evidently belongs in the C. Goodenovii group with two stigmas, and is nearest C. Goodenovii var. limnophila (Holm. as vulgaris var., Proc. Am. Acad. 17 307), but differs from that in the spongy base of the perigynia, nerveless, not sessile spikelets and narrower. It also differs fro mthe var. lipocarpa (Holm. Proc. Am. Acad. 17 308 as vulgaris var.) in the not stipitate and nerveless perigynia, granulated, clustered and short spikelets, etc. It differs still more from the var. hydrophila (Holm. l. c. as vulgaris var.) in the caespitose stems, granulated and not stipitate perigynia.

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